

Physiology

OF Woman.

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THE
PHYSIOLOGY OF WOMAN,

EMBRACING

*GIRLHOOD, MATERNITY AND
MATURE AGE,*

WITH ESSAYS ON

"COEDUCATION OF THE SEXES IN MEDICINE," "THE PHYSIOLOGICAL
BASIS OF EDUCATION," "TEMPERANCE FROM A PHYSICIAN'S
POINT OF VIEW" AND "A PLEA FOR MODERATION,"

BY

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TO MY HONORED TEACHER AND FRIEND,

Dr. Wm. B. Byford,

ONE WHO HAS DONE MORE THAN ANY OTHER MAN,
LIVING OR DEAD,

FOR THE MEDICAL EDUCATION OF WOMEN,

AND WHO HAS NEVER FAILED TO RECOGNIZE WOMEN,
WHEN EDUCATED,

AS PEERS IN THE PROFESSION,

THIS BOOK IS MOST SINCERELY AND RESPECTFULLY
DEDICATED.

PUBLISHERS' PREFACE.

IN this volume is presented a woman's book for women.

Sarah Hackett Stevenson, M.D., needs no introduction; she is well known as a physician, a professor and a writer.

At the solicitation of the Publishers, who knew her eminent fitness for the work, Mrs. Stevenson has prepared "THE PHYSIOLOGY OF WOMAN."

It is published with a hope of saving the women of the future from the penalty of ignorance concerning themselves—a penalty which untold thousands are suffering.

The appended papers on "Co-education of the Sexes in Medicine," "The Physiological Basis of Education," "Temperance from a Physician's Point of View" and "A Plea for Moderation" are of great practical value, and possess literary merits which entitle them to careful perusal.

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INTRODUCTORY.

“I believe the highest order of innocence is ignorance,” are the words of a man of “very high standing and enviable reputation,” in a letter* addressed to Dr. Storer, protesting against the publicity that author gave, a few years ago, to the prevalent crime of abortion. This, too, when the logical deduction to be drawn from Dr. Storer’s writings is, that ignorance is the principal cause of the crime. “Ignorance is innocence,” is undoubtedly the prevailing sentiment among women concerning themselves, and even the penalty which ignorance invariably exacts of woman, does not always open her eyes; because she is taught that it is not only her duty, but her blessed and peculiar privilege to suffer. But the common school and the interrogation point are fast friends; and, as

* Why Not? Prize Essay, by N. R. Storer, M.D. (Appendix.)

the school has made no distinction in regard to sex, so we find the interrogation point at the tip of the tongue of every girl in the land. If this question "Why?" had long ago been asked, Dr. Storer might never have been called upon to answer the question, "Why Not?"

The crime of woman's ignorance is expiated, as so many crimes are, in the blood of innocence. Broken law knows no sex. It never says, "I will not exact my bond because this creature is a woman, and did not know." Everywhere and always law is inexorable. Even God's forgiveness does not, and indeed from the very nature of things, cannot make a liar, a thief, or a murderer, just what he was before the sin was committed.

In this world we are environed by an infinite network of laws, physical, mental and spiritual, and the only way to keep them is to know them. Many of them are already discovered, but we have reason to believe that many more are still unknown, especially those that have in keeping the finer part of us. The penalty which never fails, often awakens the first consciousness

of the existence of the law. Assuming, then, that woman suffers as a criminal for her ignorance of the laws of her own being, I feel justified in trying to simplify the knowledge which physiology has given us concerning those laws.

As regards the many books upon similar subjects, there are none, to my knowledge, of any authority which do not teach that nature intended women to be invalids; hence the need of another book. This is not in any sense a medical book. Medicine is not, and never can become, a popular science. I oppose self-prescribing in every form. The physician who offers prescriptions to the public places himself upon the level of one who puts a patent medicine into the market. The target at which I have aimed is the false teaching which women have received. If any of my medical brethren are guilty of thus fostering the credulity of the ignorant, from them I expect censure. On the other hand, I believe that no true physician can object to any information these pages seek to impart.

THE AUTHOR.

The Mother's is the Angel Hand
that must break
the Great Seal of the Future.

THE PHYSIOLOGY OF WOMAN.

CHAPTER I.

FROM GIRLHOOD TO WOMANHOOD.

Doctor Napheys, in his "Physical Life of Woman," says: "The two years which change the girl to the woman, often seal forever the happiness or the hopeless misery of her whole life." This is but part of the truth; the happiness or the hopeless misery depends, not upon two, but upon all the years that precede this period. Indeed, the health of a woman is often sealed before she has left her mother's womb; the type of her womanhood is determined then and there; her after-life can, at the best, only develop, while it may deform that type.

TIME REQUIRED FOR DEVELOPMENT.

Besides, no woman is ever developed in two years, unless menstruation be taken for that development, when it is only the sign of its beginning. It requires all the way from five to ten years to change a girl into

a woman. Girls of sixteen and eighteen, like boys of the same age, are nothing but children, unless they have been reared in a very unwholesome atmosphere. No matter how long they have been menstruating, they should neither think of themselves nor be thought of as women, till they are at least twenty years of age, and they are not completely developed, anatomically, until about the age of twenty-five. Then the osseous or bony system ceases to grow, and then may the numerous ligaments of the pelvis, and the articulations of its many joints, and the articulations of the ribs be safely put to the strain that child-bearing necessitates.

EFFECTS OF GREAT STRAIN UPON THE ARTICULATIONS.

I believe that much of the pain of which ailing women complain, and which is usually charged to the uterus or ovaries, is a true arthritis or inflammation of the joints, arising from the excessive strain upon these articulations before their maturity. Were this same strain made upon the elbow or shoulder of a growing child, no surgeon would fail to protest. There is nothing in the anatomical structure of the pelvis that makes it an exception among the bones of the body. Especially, are surgeons careful concerning the

strain of ligaments in other parts of the body. Many of the ligaments of the pelvis are scarcely named in works on the mechanism of labor; so the articulations and ligaments of the pelvis have never received the attention they deserve. This is true, likewise, of the ribs, and the insertion of the diaphragm. Patients of this class usually suffer intense pain in the lower region of the chest at the outer border of the diaphragm; also at the points of insertion of the lower ribs into the spine and sternum.

DEVELOPMENT OF THE OVARIES.

The ovaries, which are the only positively essential organs of reproduction in the woman, begin to develop in the second month of the life of the unborn child. By the time the infant is two years old these organs contain not only all, but even more germ-cells than they ever will contain. From this time on these cells begin the process of ripening, by which they first increase in size and then are discharged or shed, after the manner of ripened seed from its pod. The ovary, then, is developed as any other gland of the body, by a slow and gradual, instead of a sudden, abrupt process, implying all the difference between a calm, regular evolution, and a sudden, violent upheaval. The development of these glands goes on without any sex-

nal disturbance whatever; so far as the child's health is concerned, there is, as yet, no sex. Indeed, the function of the ovaries is not a sexual, but a nutritive function. The ripening and discharge of the ovum, or seed, is as involuntary and separate from sexual appetite as the preparation and discharge of the bile or saliva.

If only it could be shown that girls have greater trouble than boys in teething, then might sex be called a disturber of her childhood, as it is of all the other years of woman's life; but, as a general thing, girls have less disturbance than boys in the process of teething, arising from what I think we shall see is a fact, a somewhat slower and more complicated development of the entire male organization.

ANATOMY.

To give a correct idea of the anatomy of the organs of reproduction from descriptions and drawings, is simply impossible, and much as I deprecate, in the name of science, the woman who travels about the country with a manikin, which is usually so fearfully and wonderfully made as to be unlike any known object, yet I would encourage even such imperfect attempts to gain information concerning the structure of the human body.

**NECESSITY OF PHYSIOLOGY IN THE SCHOOLS.
PHYSICIANS AS THE TEACHERS.**

With this end in view, I believe that every public school should have a course of medical teaching. This could be accomplished now everywhere, so far as boys are concerned, for there is, in every town in the land, a physician who is competent to teach young boys just what they should know in regard to themselves. But not so with girls. Women physicians are yet the exception, and they alone should impart that which it is essential girls should know.

After one has become familiar with the organs of the body by actually seeing them, or by the study of good models, then the drawings of the books are very helpful. But the most difficult part to comprehend, is not the size, shape, or position of the separate organs, but their relations to each other. In any view that is attempted upon a flat surface, some of the parts must be displaced in order to show those they cover.

THE UTERUS.

It is of the highest importance that every woman should know the position which the uterus, or womb, occupies in the pelvis; for, it is owing to the displacement of this organ that much of the ill health of women depends. The uterus is about the size and

shape of a small sized egg, or pear, with the tapering end pointing downward. It is made of muscle, just the same kind of material that constitutes the lean part of meat, with which every one is familiar. It is lined with what is called mucous membrane, the same kind of lining that we find in all the outlets of the body, and is well illustrated in the lining of the mouth and nose. This membrane is very important, because it has so much to do with menstruation, and pregnancy, as we shall see. To the physician, there are very important distinctions to be made between the different parts of the uterus, but these are all continuous with each other, and are of no practical importance to the general student.

LOCAL TREATMENT.

The narrow elongated part or the neck of the uterus, is the only part which is at any time visible. It is fitted into the top of the vagina which opens to receive it, and by the use of instruments, it can be exposed to view. This is both fortunate and unfortunate for woman—fortunate when operations and applications are needed and skillfully performed; but unfortunate in that it has been the means of building up a routine practice as useless as it is demoralizing in its results. I quote the following extract from an editorial in a

late number of the Chicago *Medical Gazette*, one of our leading medical journals. "Patients have been passed on from one doctor to another, in order to undergo the same routine, exposure and application once or twice a week.

The moral influence on the patient of all the exposure which long continued local treatment necessitates, cannot be other than pernicious; if, indeed, this moral influence be not productive of more evil than the disease itself." When medical men, especially men who are making diseases of women a specialty, begin to talk and write about the morality of local treatment, it must be time that women should arouse from their mental and moral lethargy sufficiently to acquaint themselves with the constitution of their own bodies, and thereby prove that they have some claim left to the womanly modesty which is supposed to belong to them.

SUPPORT OF THE UTERUS.

By what has already been said, it is plain that the vagina, the fleshy tube leading to the uterus, is itself a support of the uterus. The other supports are ligaments; the most important are called the broad ligaments: they stretch from each side of the uterus, and are attached to the sides of the pelvis in such a way as to divide the pelvis into two nearly equal parts--

the bladder occupying the front and the rectum the back part of this division. The pelvis is that part of the body which lies between the hips and the legs. It is a bowl-shaped cavity containing the organs of generation in its central part, while the bladder lies in front and the rectum behind, as I have stated. The partition made by the broad ligaments looks something like a handkerchief folded in a triangular shape, the apex of the triangle pointing downward, while the uterus and ovaries are suspended between and hidden by the two layers or folds of the ligament.

THE RECTUM.

Behind the uterus and vagina, lies the rectum. This canal is often the seat of diseases, such as hemorrhoids or piles, ulcers, fissures, and fistulas. But very many times these difficulties are the direct consequence of neglect in emptying the bowels. Women, especially, should give this function of the body serious attention. The retention of this waste matter acts injuriously on the system, both mechanically and chemically. Mechanically, it causes displacement of the uterus, and the long continued pressure and displacement change the size and structure of the bowel itself. Especially, is the circulation of this part injured. The blood vessels are very numerous, and the

pressure of the retained waste matter prevents the proper return of the blood back to the heart, so the parts become engorged, and the result is piles, ulcers, etc. Chemically, the effect of this retention is truly toxic, or poisonous.

SEWERAGE OF THE BODY.

The bowel is one of the great sewers of the system; if it is not thoroughly and systematically emptied, there is an effort made by the little vessels along its track to re-absorb the contents, and usually to a great extent this worn out, effete matter is taken up into the blood again, and we get the result in dingy, sore looking skin, bad breath, lassitude, etc., a group of symptoms commonly known as "billiousness."

I dwell upon this point because the bowel is so closely connected with the generative organs, and because its diseases are so often overlooked in ailing women. My own experience is, that a large proportion of cases now under local treatment, would cure themselves if the bowels were properly cared for.

WHAT TO DO FOR CONSTIPATION.

Here is a great lesson for parents. Torpidity of the bowels is very common among children, but it is a difficulty which never should be tolerated, and hygienic measures, rather than medicines, should be

used to overcome it. Among these are kneading of the abdomen, rubbing the bowels with oil, especially castor oil, salt hip baths, *enemas* of cold water, etc.

WHAT TO TAKE.

When I am asked "what to take" for this condition, I usually advise a bowl of hot, thin corn meal gruel before breakfast, or some kind of fruit—an orange or apple. Frequently a glass of pure, cold water, taken the last thing at night and the first thing in the morning, is all-sufficient.

NATURAL CONDITION.

Few people know what a natural passage really means. I am obliged often to cross-question my patients to ascertain what I suspect. According to their own story, their bowels are regular, they are not constipated; but further inquiry shows the passages are invariably hard and scant, instead of soft and full. The irritation of these hard masses upon the delicate lining of the rectum is only evil, and that continually. These masses should never be allowed to pass until they are broken up and softened by *enemas* of warm oil.

I have read that the great physician, Boerhave, kept an elegant book which he said contained all the secrets of medicine. After his death the book was

opened, and in it were written these sentences: "Keep the head cool, the feet warm and the bowels open." Whether the story be true or false, its teaching is perfectly true; but women as a class keep the head hot, the feet cold and the bowels locked up. What wonder they complain of "weakness?"

THE BLADDER.

Closely connected with the position and diseases of the uterus, is the condition of the bladder and the canal leading out of the bladder, called the urethra. Indeed, these three passages—the urethra, or bladder passage, in front; the vagina, or uterus passage, between, and the rectum, or bowel passage, behind, are so close to each other that an inflammation of one is very commonly followed by an inflammation of the others.

NECESSITY FOR THE CARE OF THE BLADDER.

The care of the bladder is quite as important as the care of the bowel. Persons may be injured for life by not attending promptly to the call of nature to evacuate the bladder. School-children are often made to suffer in this manner. Such treatment is simply barbarous, and should be denounced with great severity. Women, too, are sometimes forced by motives of delicacy to neglect this important function

of the body. Such neglect, though only occasional, may result in permanent injury to the bladder and its outlet, the urethra.

CAUSES OF INFLAMMATION IN THE LOWER PART OF THE BODY.

Then the causes of inflammation, namely, impoverished blood, and the difficulty in the way of the return of the blood to the heart—the literal damming up of the current—these causes, especially the damming of the current, act alike on all the organs in the lower part of the body. All people who lead sedentary lives, who sit or stand a great deal, and have no variety in the motion of their muscles are especially liable to congestions and inflammations of the pelvic organs. Men are subject to hemorrhoids and diseases of the kidney and bladder, while women suffer from uterine diseases.

ANATOMY OF THE OVARIES.

The ovaries are about the size and shape of almonds. They are two in number, one on each side of the uterus, within the fold of the broad ligament which I have described, and connected to the uterus by the Fallopian tubes, which are thus named from their discoverer. These ovaries, or seed pouches, are made up essentially of little bladder-like cells, held together by a fibrous tissue containing nerves and blood vessels.

WHAT DETERMINES SEX?

I have often been asked the question: "Is one ovary male and the other female?" In other words, do the germs of one ovary produce males, and those of the other, females? There is no reason to suppose that there is any difference whatever in the cells of the two organs. As to what determines sex, it is still a matter of doubt. Many ingenious theories have been advanced, but none of them explain all the phenomena.

THE WOMB NOT ABSOLUTELY ESSENTIAL TO REPRODUCTION.

As I have said, the ovaries are the only positively essential organs of reproduction. That the womb, or uterus, is not absolutely necessary in the process is proved by the fact that a fetus may be developed outside of the uterus, anywhere in the abdominal or pelvic cavity.

THE OVARIAN CELL—THE EGG, OR OVUM.

The important part of the ovary is its cells; these, when full-grown, are about one sixth of an inch in diameter, and each one is contained in a little bladder, or sac, which bursts when the cell has ripened; after the bursting of its sac, which remains behind and shrivels up in the ovary, it passes through the Fallopian tube into the womb, and thence out of the body;

unless it has become fertilized by uniting with the spermatazoon, or male cell, which has found its way through the vagina, uterus, and Fallopian tube, to the ovary—in that case the womb retains it by throwing out membranes to protect it while it develops into a new being. If for any reason the cell fails to be conveyed through the Fallopian tube into the uterus, after it has become fertilized, it attaches itself just where it happens to lodge, inside of the body, but of course, outside of the uterus, and there it continues to develop, just as though it were in its proper place. This condition of things is more or less disastrous to the mother, because of the inflammation which the presence of the foetus is liable to cause in the parts where it is located. However, the symptoms of this kind of pregnancy are usually of such a nature as to be readily detected by an experienced physician. Hence, the necessity of early medical advice in these cases. Indeed, I think that in view of all the disasters which are possible in pregnancy, it is much safer for every prospective mother to consult her physician at once, and thus give him an opportunity to avert danger.

These cells were not discovered until 1845. Previous to that time there were a great many theories

in regard to reproduction. This process of ovulation, as it is called, being discovered, is made accountable for all that is otherwise unaccountable. Especially is this true in regard to menstruation.

The older writers looked upon menstruation as the result of an over-abundance of nutrition which accumulates in a woman's body to nourish the forming child; but, if the woman is not pregnant, this extra nutritive fluid is discharged from the body.

Late writers make menstruation the result of ovulation, or ripening of the seed; and ovulation, according to this theory, is the result of great sexual excitement. They describe all the organs of generation, especially the ovaries and the uterus, as being in a state of active congestion, like a congested lung or brain demanding complete rest, menstruation being a pathological hemorrhage—the result of the great congestion, like, for example, a hemorrhage from the lungs.

NORMAL MENSTRUATION SHOULD BE WITHOUT DISCOMFORT AND WITHOUT PAIN.

Doctor Emmett writes as follows: "Every woman, even in health, will experience at least some degree of discomfort during the menstrual period. That she should be absolutely free from pain, and suffer no inconvenience at this time is an abnormal

condition.”* It seems hardly possible that any one familiar with the mechanism of the human body should affirm that it is abnormal for any one of its functions to go on without disturbance. Suffering surely means broken law. If the function of these organs is physiological, it cannot be pathological. In the same book, the author shows from an analysis of over two thousand cases treated by him, that a very large majority had painless menstruation. What should we think were a writer on practice to assert, that to suffer no pain or disturbance during digestion is abnormal. Because a large proportion of people abuse the digestive organs, and suffer from different forms of dyspepsia, does that make painless, comfortable digestion abnormal?

I wish particularly to dwell upon this point, because so many women labor under the delusion that pain is natural. On asking the question, “Do you suffer pain?” the answer is generally, “no more than is natural.” My reply is invariably, “ANY PAIN IS UNNATURAL.”

THE MOST REASONABLE THEORY OF MENSTRUATION.

If the ovarian cell is not impregnated when it reaches the uterus, the mucous membrane undergoes

*Principles and Practice of Gynecology, p. 181.

a change which is called fatty degeneration. It is in the process of this change that the menstrual discharge takes place, and is, probably, the result of that change, though the material which is discharged is an extra supply of blood which has been accumulating throughout the month. Why this accumulation? Is there any need of it? We shall see. At the end of about twenty-eight days, this accumulation has so increased the tension of the blood vessels that there must be a hemorrhage from some mucous membrane to relieve that tension. The fatty degeneration of the mucous membrane of the uterus makes the vessels which supply that membrane the weakest point in the circulation; hence these vessels are the first to yield; hence, too, it follows that if for any reason the mucous membrane of the uterus does not yield, there is a bleeding from the mucous membrane of the nose, bronchial tubes, stomach, or bowels, and sometimes the breasts, known as vicarious menstruation. This discharge does not take place during pregnancy, for the reason that the extra amount of blood is utilized in the growth of the embryo; nor does it usually occur during consumption and similar wasting diseases, for the reason that the extra supply is utilized to make good the rapid waste that is going

on in the system. We thus see the reason for this extra supply of blood, and the reason for its discharge from the body.

WHY MENSTRUATION IS NOT A DEBILITY.

According to well-known laws of physiology, the period of increased nutrition, or blood supply, should be a period of increased strength. A close observation of healthy women proves, that the days preceding menstruation are days of increased power. Not understanding the meaning of this, women often tell me that just before their periods they feel like undertaking an extraordinary amount of work, and frequently do accomplish more during the few preceding days than in all the month beside. It may be that this normal condition of extraordinary nutrition is what some are pleased to call "temporary insanity." If this be true, then this is just the kind of insanity that we, as physicians, are attempting to bring about when we administer tonics and nutritious food. We want to increase the quality and the tension of the blood. This is just what nature does periodically for woman, so that menstruation, instead of being a period of depression should be one of strength.

The only person of whom I know, who has taken

this subject out of the realm of theory and mere casual observation, and placed it upon a plane of fact and demonstration, is Doctor Mary Putnam Jacobi. She found by direct experiment that just previous to menstruation there is an increase in the excretion of urea, in the temperature of the body, in the tension of the arteries, and in muscular strength. Now what does all this mean? As I have described in another chapter, the combustion that is always taking place in the body results in accumulation of ashes or debris. One of the most important forms of this debris is known as urea; it is thrown out of the system by means of the kidneys, and its retention is deadly in its effects. It follows then, that an increase of urea means an increase of combustion—a greater state of activity followed, as in the burning of extra fuel, by an increase of temperature. Now the amount of heat generated in the body bears a direct proportion to the work performed by the muscles, just as work of an engine can be measured by the number of heat units generated by the steam. By experiments made with the dynamometer, and by the lifting of weights, it was found that muscular power was likewise increased during the week preceding menstruation. It is only of late years that the tension

or force of the blood in the arteries, has been the subject of common observation. By fastening an instrument called a sphygmograph on the pulse of the wrist, each movement of the artery moves a pencil which leaves a tracing on a bit of paper. By comparing the tracing of the artery before menstruation, with its tracing between the periods, the first is found to be fuller and stronger. These things indicate an actual increase in the mass of blood in the body, and this increase is reduced again by the discharge, for this discharge is always followed by a lowering in the amount of urea, temperature, muscular strength and arterial tension.

CHAPTER II.

INFLUENCE OF THE IMAGINATION.

Mothers should not encourage their daughters to look upon this period as one of sickness. While I would not encourage the undertaking of any extraordinary work, yet my observation of a large number of women, proves to me that moderate work and exercise at that time are helpful rather than hurtful. One of the worst cases of painful menstruation I have ever known, a case that had been under the care of able physicians in Columbus, Baltimore, and Chicago, confessed herself greatly benefited by taking a long walk at the beginning of the period. Every physician knows the influence of the imagination over the functions of the body, and that men are just as susceptible as women in this direction—the only difference is that the employments of men are more

engrossing. They have less leisure in which to brood over and magnify their ailments. Habitual constipation has been cured by this influence alone. The power of expectancy is wonderfully potent, too, in the periodical recurrence of chills. I have known patients to look at the clock, and make all preparations to shake at just such an hour, and shake they did; but if by some unexpected occurrence their attention was diverted, the time passed by without the recurrence of a chill. So when women are trained from their very childhood to lie in wait for a monthly attack, the morbid expectancy itself forms a large element in the case. Working women, as a class, never think of resting at this time—such a thing is absolutely impossible even were it necessary to health. If the Creator demands that women should be invalids one week in every four, then the State is very unjust and cruel in compelling them to disobedience; if the Creator has made them sick, then the State should care for them, as for the blind and insane, and other helpless classes.

SIX CAUSES OF GOOD HEALTH IN WOMEN.

The analysis given by Doctor Jacobi in her prize essay “*Rest for Women*” clearly proves that freedom from menstrual suffering is dependent upon the fol-

lowing antecedents: First, upon vigor of childhood and family health; second, degree of exercise during school life; third, thoroughness and extent of mental education; fourth, the general health and capacity for exercise maintained after school life; fifth, steadiness of occupation; sixth, marriage at a suitable time. These conclusions are based upon a thorough scientific analysis of cases, and they are worthy the consideration of every woman. Unfortunately they are inaccessible to those who most need them, being locked up in the technicalities of medical language. For this reason, I wish to dwell at some length upon them, hoping that they may thereby gain something of the popularity they so richly deserve, and of which the public has so much need.

VIGOR OF CHILDHOOD.

In regard to the vigor of childhood, its value can scarcely be over-estimated. There is little doubt that constitutions are born, not made. There is little doubt too, that the ideas as to what make up a good constitution are often erroneous. It is a matter of common observation among physicians, that the largest and healthiest looking children are sometimes the first to succumb to disease; while those of a smaller and even imperfect development are capable

of great resistance ; but, I do not find any physician stating the cause for this so clearly as does Dr. Richardson.* He makes a good constitution or the power to resist disease to consist in "the equal balance of all the working organs of the body, not one of which is specially inclined to take on any form of disease of a particular kind, such as tubercle or cancer. The whole body therefore continues to work in all its parts in harmonious order of function, and by the steadiness of functional work the continuous life is maintained. Life, in short, is maintained by equality of perfection in every organ."

HEREDITY.

That the constitution of the child depends upon family history is true. Heredity, though its doctrines are surrounded by a great deal of popular nonsense, being the fashion of the hour for those who affect science, is notwithstanding, a constant factor in human, as well as in all other forms of life. While marriage is undoubtedly a sanitary measure to the parties engaging in it, possibly, it may be anything else to the child of that marriage. While man has the legal right to entail upon the unborn the taint of blood, his moral right is a serious question; and

* Ministry of Health, p. 160.

if legislation has a conscience concerning cousins, how much more conscience should it have concerning insanity, drunkenness and syphilis. What right before God or man has any individual to perpetuate upon innocent flesh the scars of his own debauchery? Yet, where is the family that is entirely free from these ravages. Knowledge here is safety. The young girl should know the danger that possibly awaits her and her children. Great stress, but not too much, is laid upon the legality of marriage; yet not a thought is given to its morality. A marriage certificate is made a necessity. Had I the power I almost believe I would make a physician's certificate equally necessary. If the parties are bound by oath concerning their names and ages, much more should they be bound concerning any taint in their blood. Traitors to their country expect to lose their citizenship, so traitors to moral purity should be deprived of marriage with the pure. An eminent surgeon makes the statement that "a man who has once contracted the loathsome disease syphilis, will always have it; if he marries his wife and children will have it, and when he dies his ghost will have it." How many heart-broken mothers have I heard repeat that sad refrain, "Had I only known; if somebody had only told me!"

A thorough discussion of this subject would lead me into the question of moral education further than I have time to go; though I believe the true physician should be and to a great extent is the conservator of moral as well as of physical life. Indeed, the question under consideration, the great question of maternity, includes the question of paternity—the relation of the sexes to each other, out of which grow the greatest moral questions, not only of our own, but of all time. For what is a human being without character, and the very essence of character is moral purity.

PERNICIOUS TEACHING OF SO-CALLED REFORMERS.

There are many false ideas set afloat by so-called reformers, who have gotten hold of a host of half truths concerning “temperament,” “affinities,” and all that. In reply to these I suggest that parties who are free from blood taint, and are blessed with a modicum of common sense, may marry if they especially care for each other, even though they have the same complexion and the same shaped nose. It is lamentably true, that it often requires the guilt of some moral obliquity in husband or wife to discover these “incompatibilities,” lack of “sympathy,” want

of "affinity," or whatever other name the violated conscience may invent for the occasion. We all know, too, that there are marriages which, from the very nature of things, are living death; but I still affirm that much mischief has been bred by a pseudo-scientific literature under the name of Biology, Psychology, Phrenology, and even Physiology, for there is no domain these prolific writers will not dare to enter. In considering this question married people should always impose upon themselves one restraint, the welfare of their children. It is no longer a question of husband and wife, but of parents. This consideration would save many a home that is now wrecked. So firm is my conviction upon this point, that I believe it is better to have even a sad memory of home than no memory at all. The memory of a childhood's home is an anchor sure and steadfast throughout all the years.

O, how the low, moss-grown roof seems to lift up, and the narrow portal to widen, when for the first time we realize that the footsteps of angels trod that pathway to the door and wore the old threshold away!

SHOULD CHILDREN BE TOLD OF A BAD INHERITANCE?

Another point to be considered in this question of

heredity, is whether children should be told of their inheritance. Upon this, as upon every other subject touching man's weal or woe, an intelligent knowledge is of vital importance. I say intelligent knowledge because there is such a thing as an ignorant, helpless knowledge—such as being in possession of a single fact without any of the associate facts. For example, a person may know that his parents were consumptive or insane. The simple knowledge of this fact alone might be worse for him than the ignorance of it. Those who know such dangers without also knowing how to avoid them, are made more susceptible to those dangers because of the dread the knowledge brings. Sooner or later children know the weaknesses of their parents, whether physical, mental, or moral, but the knowledge usually stops here. They are seldom taught how to avoid those weaknesses. This is a point requiring great judgment in the training of children. Instead of holding certain inheritances as terrors over their heads, they never should be referred to, save as things that can and must be conquered.

RESUME.

The first consideration then in the chances of the child's life, be the child male or female, is to be well

born—to come into this world with a proper balance of forces ready to combat the forces from without that are ever seeking to overcome that equilibrium. There is no reason why the human organization should not hold its own for at least one hundred years.

CAUSES WHICH OVERCOME THE VIGOR OF CHILDHOOD.

There are many causes operating to overcome the vigor of childhood ; one, especially has come under my own observation, and I think every mother should be warned against it. I refer to the irritation of the child's private parts either by his own hands, or by some irritating substance, such as clothing, filth, or in boys the narrow opening of the external meatus. I believe from observation that the practice of self-abuse is much more common among boys than girls. Not alone that boys have more license in these directions, but because of the more frequent congenital nature of the trouble. I have not sufficient data for a positive opinion, but I believe it can be shown that much of the erratic behavior of boys is the reflex result of the nervous irritation set up by accumulations within the orifice, or by the pressure of a too small external opening of the genital organ. I have cases on record showing that the entire moral character

of boys has been changed by simply dividing the integument at the orifice, thus relieving the pressure of the sensitive nerves at that point. If a boy has an otherwise unaccountable disposition to lie, steal, run away, or commit suicide, I should advise a thorough examination of the sexual organs, and the closest scrutiny of his habits. There is no doubt self-abuse is often an instinctive attempt for relief on the part of the child. Excessive goodness or excessive badness in a child is a suspicious sign. I have come to look upon either extreme as an indication of disease. A fair amount of mischief is wholesome, and its entire absence is usually accompanied by a lassitude of body or a mental precociousness which proves to be anything but wholesome. Nor is it natural for a child to be totally depraved—a certain theology to the contrary. All such children need medical care, and if they had it of the right kind, and at the right time, society might be spared many an adult criminal.

SEX A DISTURBER OF HEALTH?

Parents seem to be perfectly oblivious of the fact that sex has any meaning, except as applied to the girls of the family; the reason of it is apparent. The period of the beginning of sexual growth in the female is marked by an involuntary discharge from the body

of the secretions of the sexual organs; while in the male sex these secretions are retained, and placed under the control of the will, or the appetite. That they equal, if they do not exceed in amount the secretions of the female organs, and draw as heavily upon the general nutrition of the body, are points maintained by some of the most eminent of our physiologists. If to these facts we add the fact that the male sexual organs are considered to be of a higher physiological development than those of the female, then, on theoretical grounds men should have more sexual disturbance, for the higher the type the more complicated the structure, the more easily is the function disturbed, and the greater the liability to disease. That disease may never amount to a positive lesion, but Dr. Weir Mitchell,* in his clinical lectures on nervousness in the male, gives substantial proof of this sexual disturbance. He prefaces his statement of cases with these words: "Many years ago when we first began to sum up and classify the cases which came to my clinic at the Infirmary for diseases of the nervous system, my assistants called my attention to the large number set down as general nervousness, and I then saw with

**Medical News and Library*, December, 1877.

some surprise that so many of these were men. This was the more notable because, of course, the persons who seek help at the Infirmary, are mechanics and working men chiefly, and therefore hardly such as are presumed to suffer from nervousness. . . . We rarely see this condition delineated in the books. You may read whole text-books on nervous diseases, and see no mention of this striking, this annoying, this painful condition; or, if spoken of at all, it is as if it were entirely the sad prerogative of woman." After graphically describing one of the most marked cases, he says: "Had this been a woman's case, no one would have failed to label it 'hysteria.'" No impartial judge can fail to recognize the truth that the element of sex has been assigned too much importance in the diseases of women, and not enough in the diseases of men.

There are some forms of nervous diseases that are far more common and violent among men than among women; Tetanus, for example, and Hypochondria. There is also a form of Vertigo to which men are especially liable between the ages of forty and fifty. The worst cases of nervous sick headache I have ever seen have been men, and so of Epilepsy. When these diseases attack men they are called by

their proper names and treated as diseases, and not as reflex actions of the sexual organs; whereas, the same affections in women are referred immediately to the uterus and ovaries.

I have in mind several very eminent men who are afflicted with what are popularly known as "the fidgets," (involuntary muscular contractions,) to a degree that is positively painful to witness, especially if they have been trying to keep perfectly quiet for any length of time, in church, for example.

As to the question of "morbid appetite," about which so much has been so eloquently written, I fail to see the line of demarcation between the cause which excites a taste for a bit of chalk or slate pencil occasionally, and the cause which excites a taste for rum and tobacco continually. Both classes of substances are equally digestible to the stomach and agreeable to the taste—of any perfectly sane person.

MAN'S STRENGTH AND WOMAN'S ENDURANCE.

It is a common saying among physicians that man has more strength, woman more endurance; but the saying is very difficult of scientific analysis so far as the woman is concerned. Man's strength is a function of his muscle, but what is the source of woman's endurance? Not her muscle, for that, according to

all authority, is below par; still less her nerves, for they are, according to the same authority, in a pathological condition for at least one-fourth of her time, to say nothing of the period required for convalescence. Is it in her blood vessels or vascular system? Surely not; for this is the seat of a constantly recurring congestion, which causes or is caused by the disturbance of the nervous system. In what, then, does her endurance consist? Even the most plausibly constructed tables show that on the whole, the viability, or power to live, is greater in the female than in the male. Not all the evils of society and perils of childbirth have been able to affect the balance against woman. Medical men have to confess their astonishment at the amount of resisting and recuperative power manifested by the most delicately organized women. The chances for life and health, then, are on the side of the female, not only on the theoretical ground of a less complicated organization, but according to mortality tables as published. Nearly twice as many boys as girls die before they are born. The statisticians tell us this is because the boys are so much larger than the girls; but this does not change the fact that they die from want of adaptation to their environment. It is this power of adaptation to surroundings

that has made woman survive in spite of circumstances, and the low physiological grade of her sexual organs, has saved her from the otherwise inevitable death resulting from their maltreatment.

CONCERNING EXERCISE DURING SCHOOL LIFE.

The second element in the menstrual health of woman is the amount of exercise taken during school life. The effects of sufficient or insufficient exercise, according to Dr. Jacobi, are felt more after the cessation than during the school life. These being the formative years they decide the fate of the future woman ; even a faulty constitution may be much modified during the first twenty years of a life. It is a lamentable fact that girls, even little girls, are prejudiced against exercise all too soon. They are taught it is unladylike to romp ; while the terror of spoiling their fine clothes, is to many of them an obstacle insurmountable. According to Dr. Jacobi's estimate, anything less than three hours' exercise during the day is altogether insufficient, and this exercise should be carried on in the open air. The artificial air of the school-room and the home is all the while enfeebling the bodily powers.

L. W. Leeds, said to be the greatest living authority on ventilation, gives the following startling description of the air which school children are breathing:

“It is usually estimated that, what with the destruction by the lungs and cutaneous transpiration and other emanations from the body, every child will contaminate, so as to render it unfit for healthy breathing, several cubic feet of air a minute. A school-room forty by twenty feet on the ground and eighteen feet high contains 14,400 cubic feet, so that in about twenty minutes one hundred pupils will contaminate the whole body. The opening of a door, (or two doors, if they are on the same side of the room) of a room destitute of any open flue, will cause no change of the air of such room to speak of, because if the air cannot go out it cannot come in a room; but we will allow, from this cause and the air which comes in through the cracks and crevices, one cubic foot of air to come into such a room every minute. This 14,400 cubic feet of air every twenty-four hours will renew the air in such a room only once in ten days, so that for all practical purposes of ventilation, the air from the doors and cracks amounts to nothing. If, then, the whole body of air within this school-room be contaminated in twenty minutes, what state must the air be in at the end of even one day of eight hours, when it must of necessity have been subjected to the same deterioration twenty-four

times? What at the end of one week (the same body of air having been locked up every night for use the next day) when the emanations from the lungs and bodies of these children will have been added 144 times? In four weeks 576 times; in a twenty weeks' winter 11,520 times? The very walls, and especially the ceilings of such a room become so impregnated as to affect visitors' olfactories to such a degree as to affect the stomach. The fact is within the experience of all persons who are in the habit of occasionally entering an old school house, even when no pupils are in it. Such appears to be the subtlety of this poison absorbed by the walls, ceiling, and floor of a school-room, that a whole summer's sweep of air through it has no perceptible effect on its extraction; the very day that it is again closed up for winter, the same smell of corruption is just as apparent as the year before."

From such dangers as these it is a wonder that any children, especially girls, escape. The outdoor games of boys to some extent overcome the indoor poisons. Once in the day, at least, the lungs are filled with pure air. But what of the girls who decorously mope to school, and mope home again into an atmosphere just like that of the school.

While many children are thus slowly poisoned by bad air and want of exercise, I am aware, on the other hand, that some children are injuring themselves by excessive exercise. There is, in some circles of society a tendency to adopt German gymnasium practices, the English ball games and boating. American children are not as phlegmatic as either the German, or English. On account of our dry, stimulating climate, the nerves of our children, and adults, too, are in an irritable state. Hence the majority of pure blooded American people need sedatives rather than stimulants. This is especially true of children in large towns and cities.

I have found that scrawny, irritable children grow fat and jolly when they are put to bed, fed frequently, and treated with an oil bath at night and a sun bath in the morning. Just here, is where good judgment is needed on the part of the parent. A dull, phlegmatic child needs a great deal of active exercise to overcome the natural inertia of his organization, and a nervous, wiry child should be made to rest whenever possible, and its exercise should be of a passive rather than an active character.

What is known as "massage," the French name for rubbing, is the most helpful form of passive ex-

ercise, and is especially adapted to all nervous people, adults as well as children. In no case should the patient attempt to do the rubbing, for that would transform the passive into active exercise, the very thing to be avoided. A good, strong, healthy rubber should always administer the treatment. It seems hardly necessary to say that the mind of these nervous children should also be put to rest, but the trouble is, these little ones are usually precocious, and their fond parents are very proud of that precocity, so the mind is encouraged to burn out before it has matured.

MENTAL EDUCATION.

The third proposition made by Dr. Jacobi is a startling one, and in direct opposition to the theories of those who look upon the sex of woman as a disease, namely: That menstrual health is good in proportion to the thoroughness and extent of mental education. What is called the ornamental system which includes music and modern languages corresponds with a less degree of health, while those who have taken the higher studies which include mathematics and Latin, are among the healthiest class. This is sound doctrine and corresponds with a law evolved by the statistics of Beard and Madden con-

cerning the longevity of brain workers. According to these authors the average age of the brain worker is 64 to 66 years, while the vitality of mere muscle workers is reduced at least one-third. Of these facts Dr. Richardson says: "There is no such record to be found elsewhere, and the facts indicate more determinately than aught I know, the importance of societies which encourage the extent and domain of the mind." And yet the cultivation of her mind is held as a terror over the head of woman. The tocsin note was sounded a few years since by a Boston physician, high in authority, and the secular press took up the cry. "Educated to death" was the sensational heading of sensational papers throughout the land.

Doctor George M. Beard, who makes the study of nervous diseases a specialty, affirms "that the best of all antidotes and means of relief for nervous diseases is found in philosophy."

A paper written by myself concerning the killing of women by education, was published in the June number of the *National Magazine*, for 1875. As I have had occasion since to confirm still further the views there expressed, I have quoted the entire paper.

"'Educated to death' is the ominous title of a story going the rounds of the press concerning a girl

who, at an early age, fell a victim to the combined folly of her parents, teachers, and physicians, and to her natural want of physical endurance. The story is taken from a book of Dr. Clarke's, in which he uses it to make a strong point against the co-education of the sexes. It is just one of those things calculated to influence the casual reader and bias the uncritical public mind—a beautiful, strong, healthy girl educated to death! ‘Down with the education of women!’ cries the public, just as the public has always cried, ‘down with it!’ when but one side, or a fictitious side, of a question is held up to view, as Marc Antony held up Cæsar’s bloody mantle.

“It is unscientific for a medical man to try to prove or establish a law which is to apply to half the race by taking for his example a person with a predisposition to tuberculous disease. The description of the patient in what the mother calls health would indicate a marked scrofulous diathesis—the pure pink and white complexion and the precocious intellect. Close mental application, without physical recreation, precipitated the event; but the disease would undoubtedly have developed itself in later life, perhaps even in a worse form. The laws of school are made to meet the average class that need goading; so, of

course, under such a system the morbidly active brain gets too much work. The whole history of the case is a most potent argument for the cause of woman's education—thorough, complete education. If the mother of the girl had known and made use of the first principles of physiology and hygiene, she might have saved her daughter. If one only knows how, even inherited diseases may be mastered. The physician quoted in the story was not wrong when he said, 'Every woman is a law unto herself.' He would have been right, too, if he had said, every human being is a law unto himself. And, until the individual arrives at the age of maturity, his parents must be the interpreters of the law which is unto him. That is just what parents are for, to judge for their children according to their individual idiosyncrasies. Systems can not provide for exceptions; as a rule, school girls do not die from over-study, at the age of eighteen. We have too many educated, hale, hearty, and even gray-haired, women among the *alumnæ* of our schools for Dr. Clarke or any one else to prove that, as a rule, education kills women. For every case of 'studied to death,' we can produce five hundred of 'sewed to death,' as will be seen further on.

"Study in itself is not injurious; its normal action

is to increase rather than diminish physical endurance. It was well demonstrated in our war that the student soldiers were the hardiest soldiers. The English have another way of stating it; they say, 'The sons of gentlemen are always stronger than the *cads*.' But we are told the same rule does not apply to women; that which strengthens men weakens women. It needs great discrimination to determine how much of the feebleness of women is artificial, how much natural. I doubt if any part of it can be traced to brain-work alone. The ill-health of American women, young and old, has become notorious. It can not be the effect of our school system, pernicious as it is; for it has not been in operation long enough to affect American grandmothers; while in nine cases out of ten the invalid loses her health through the *want* of education, and not through *excess* of it. The beginning of the trouble is laid long before the child enters a school-room. It begins in American homes. The most skeptical can be convinced of this in an hour's walk in this metropolis, closely observing the children he meets, especially those on promenade with their mammas. Let him count the old wizen faces, the bird-claw hands, and pipe-stem legs, that point from the top,

sides, and bottom of the million wads that are piled on to the central skeleton; let him listen to the hollow cough that comes from the depths of the wads, and let him deny, if he can, the pleading of that voice, 'Educate my mother, teach her common sense!'

"It begins in American homes, and acts alike on boys and girls, the only difference being that the boy's life throughout is less artificial than the girl's; hence he has the help of nature to overcome the evils of his home and school education. No period of an American girl's life is a natural one, not even her babyhood. A great number of American mothers, even country mothers, whose only study was done at a district-school three months in the year, can not nurse their own children. So that precocity and the feeding-bottle are recognized as national things, even by novelists, as this quotation from Julian Hawthorne: 'Of the march of events, the news of the day, of all such knowledges as the American infant sucks in with the milk from his feeding bottle, your Saxon peasant has no inkling.'

"The average infant period is marked by a systematic effort to starve, feed, chill, or roast the child to death. Up to this time, boys and girls suffer alike,

and there is nothing to prove that infant girls do not survive those attempts to kill quite as well as infant boys.

“Now comes the general mismanagement of American children, and the special mismanagement of American girls, *little* girls. The children go through with all the bad eating, bad hours, excitements, etc., of the grown-up people; they are saved from nothing—they are simply the old folks dwarfed. Foreign children, whose health is so often contrasted with that of American children, are never seen in the drawing-room talking precociously to gray-haired people, at midnight; nor are they taken to the theaters and operas and other places of amusement. So far as the presence of children at night goes to prove their existence, you would not know they had an existence, if you were the guest of a foreign family. They have an early, light supper, instead of a late, heavy dinner; they are never seen at a dinner-table, partaking of all the courses, and they spend the night in sleep, where all children ought to spend it, repairing the waste and tear of the day.

“American mothers are falsely kind to their children in this regard. They ignorantly make it a point of duty to have the dear little things at table, espe-

cially when there is company. They are proud of the child's smartness, and they feel a heroic satisfaction when Bridget is summoned to bear away the poor exhausted little creature that has fallen asleep at the table or on the floor. If the little fellow wakes up in the process and expresses a wish not to retire, he is brought back to the guests to go through another trial for his life. This is no overdrawn picture. The chances are, if you spend an evening in a house where there are children, you will see just such scenes.

“Added to all this morbid excitement; added to the furnaces, pie crust, and ice-water, out of which the blood of our children is made, the girl has to stand all her mother's clothes!—all her mother's clothes—enough to kill ten men, and gets none of her brother's exercise which helps him to digest his pie-crust and late hours; gets no sunshine, no romps, because she must keep her face white and her feet small.

“Country life is nearly as bad, especially in the country villages, where all the worst things of city life are imitated, just as we imitate the worst features of foreign life, upon the recommendation that they are *fashionable*—a word that carries more authority

than love or law. During the winter village children are out sleighing or attending parties almost every night in the week. Even Sunday night is filled up with some excitement for the children. Eight or ten speakers are advertised to address the children's meeting; and the sight is a most pitiable one, half the poor tired things nodding in their seats, and the other half wriggling and coughing! Then comes the exposure of a sleepy child to the night air. Any one who has attended these night meetings for children can not help praying against this zeal without knowledge; while, to one who understands the human mechanism, such things are no better than murder. They are worse, because few parents would give their children a dose that was labeled poison; but if the same thing came under the name of spiritual food, they would give it freely. There is time enough through the day to attend to the children. Better, if need be, dispense with the morning sermon once a month, than thus to spend the Sunday nights in digging children's graves.

“As the children grow, the girl grows more and more into the artificial, the boy more and more into the natural; at the end of each year her freedom is abridged, while his is increased. If a meaningless

society restraint is imposed upon him, he can knock it off, start out and hunt, fish and swim, and no questions asked; but his sister dares not cut one cord of her strait-jacket, lest she lose caste, which society makes dearer than life to every woman. These artificial restraints fall harder upon the middle-class and poorer girls, who are obliged to economize and even to help themselves.

“One of the most corroding cares of American women—the one that is wearing and gnawing their health away—is the fictitious value Americans place upon appearance. The interpretation of this, in ninety-nine of every hundred cases, means “dress beyond your means,” and the greatest strain of it comes upon women. The average American mother, when she ought to be taking recreation with her children in the open air, or giving them lessons in manners and morals, is tucking and ruffling finery for her girls to outshine her neighbor’s girls. The whole *status* of the girl is made to depend, not upon what she is or does, but how she looks. ‘How do I look!’ is the everlasting story from beginning to end of woman’s life. Looks, not books, are the murderers of American women. Let any one of our middle-class women tell you her experience in keeping up ap-

pearances; ask her the greatest care and worry of her life, and what she would most like to get rid of. If she answers honestly, it will be—the burthen of dress; not her library, or the few years she tasted of books, but this everlasting making and fixing and keeping up with the fashions. Sensible Christian women acknowledge that they have to bow down to this Juggernaut of Juggernauts, or be ostracised, because every woman is judged by her appearance.

“Here is an invalid who needs air and exercise, but she acknowledges to me by the time she ‘puts up’ her hair—no one but a woman knows what time and ingenuity that means—and gets on all her clothes for the street, she is too exhausted to take a walk; so her nervousness increases, and a few years will end the struggle. Now, why in the name of common sense and Christianity, should women endure these artificial humbugs?

“Here is a practical work for the churches. The best way to prepare people for a future life is to teach them how to make a success of this life; and there is no part of this life too small, too insignificant, for Christianity to touch and brighten. Now, here is a grievous burden right in the way of woman’s usefulness and happiness, and Church members feel its

weight just as sorely and bitterly as do others. Here is a live issue for Christian teachers—the emancipation of school-girls from the tyranny of clothes. Clothes should be our servants, not our masters, ay, our murderers! Let Christian women establish comfortable, convenient, substantial suits for street and ordinary wear; suits that can be purchased ready-made at less cost of worry and time than women can sit down and make them. There are such things in use now; they are comfortable and handsome, not flimsy and forever needing repair. There is no more need of every woman being her own dressmaker than of every man being his own tailor—one is just as absurd as the other—and the sooner dressmaking is recognized as a profession, the better for womankind; for sewing-machines and dressmaking, in the hands of the unprofessional, are killing more women than all the books in the world. Christian ministers can not get a better text for a sermon; ay, sermons upon sermons are needed to root out this fictitious value of appearances, and put books, instead of sewing-machines, into the hands of American mothers. This same sewing-machine has been one of the greatest of curses to our average American society; instead of giving leisure for the mother to bestow upon the ed-

ucation of her children and to enjoy their companionship, it is used to feed a morbid vanity; and people of small means, through it, affect the style of millionaires. It is not the fault of the machine, of course, but the result of our false ideas of appearances. A well known American teacher at Dresden said to me, it was the one great thing against which she had to contend in the care of the young ladies under her care, 'the love of American display,' she called it. It is well known abroad; it has an English and a Continental reputation, and has even reached the Orient. It is a natural result of our institutions. People with us often arise from nothing; they must have some standard of excellence, so they grasp at the most conspicuous thing to their senses—livery. So they worship livery until they grow into something higher. It is this higher growth to which Christian schools, Christian ministers, Christian men and women everywhere, should lend their every energy, for the love of livery is poisoning our love of liberty."

CHAPTER III.

GENERAL HEALTH AND CAPACITY FOR EXERCISE MAINTAINED AFTER SCHOOL LIFE.

We find, in many cases, that with the close of school comes the close of all healthy activity. If the girl is fashionable, then begins her society career, whose chief exercise is dancing and shopping. The society girl who habitually takes long walks, or horse-back rides, is the exception. Such things are done occasionally, but scarcely ever to the extent of elevating them into the dignity of an exercise. Few know that in order to maintain the tone of the muscles they should perform during the twenty-four hours work equivalent to walking ten miles. The city girl deliberately chooses the foul, dusty, smoke-laden air of a crowded street car rather than a walk of even a half dozen blocks in the open air.

I think the shape of the shoe is one great reason why walking is not practised to any extent by American women. No one can walk in a narrow short toe and a heel pointing inward. The spinal column is thrown out of axis, and the weight of the body is supported upon the toes instead of the arch of the foot. The fashionably shaped shoe practically disables the feet as instruments of locomotion. The Chinese woman goes but a step farther; that is, she does not step at all.

STEADINESS OF OCCUPATION.

The wholesomeness of occupation was no doubt in the purpose of the Creator when He decreed that man should feed himself instead of being fed. Far be it from my purpose to send women out from their homes in search of a mission. Just at this time, when the reaction from the old time has reached a far extreme, it seems that women are going daft about being seen and heard. I know, personally of beautiful homes that have been abandoned because the wife and mother morbidly fancied that she was called to a higher work—one, especially, espoused the temperance cause, making a very indifferent speaker, while her own hearth-stone where she once presided with most effective power was left desolate. Another be-

came an evangelist, but her burning words found no response in the hearts of her listeners, because of her neglected children, who needed a mother far more than the world needed a reformer. It is true, women have sometimes abandoned their homes for far less worthy objects, but they have not asked and do not expect the moral sense of the community to support them in it. The care of a family is, in itself, an occupation. I have no sort of sympathy with the teachings that cause a woman to neglect the responsibilities that she has voluntarily assumed. I do not mean by this that a woman who has a family, shall not be otherwise occupied. I certainly believe that sensible women can accomplish much outside of their homes simply by conserving the time that frivolous women spend in gossiping, visiting, and meaningless conventionalities. But strangely enough, a woman is seldom arraigned for neglecting her family in the pursuit of uselessness. It is only when she is engaged in some useful employment that she is charged with neglect.

I believe that women are pre-eminently adapted to become brain workers. Dr. Richardson affirms that "muscle work, as such, reduces the vitality. There is no sign, no evidence anywhere that excessive

culture of physical strength has favored the vitality either of the individual, or of the race. The evidence lies all the other way." If vitality were dependent alone upon size and strength of muscle, why have whole species of large, strong animals died out?—perished from the face of the earth—with nothing to tell us of their existence save their bones?

Women present the two extremes—half of them are sick from *ennui*, the other half from too much work.

The class of women who apply at the dispensaries for medical aid are, for the most part, afflicted by diseases which are the result of mal-nutrition and abuse. The waste of their systems by hard work is out of all proportion to the repair which they receive from food greatly insufficient in both quantity and quality. While on the other hand the cases recorded by some medical writers of bed-ridden women, whose physicians have to threaten to play the part of lady's maid in order to drive them from their beds, make one wish that Abernethy's cure for gout, "sixpence a day and earn it," might be inflicted upon every such imbecile woman in the land. If Satan ever had a mission on earth, it is in finding employment for unemployed women. He starts them on a career of

self-contemplation; instead of some high, ennobling aim in life, they revolve from day to day around themselves, and each revolution so weakens their self-poise, that a sort of molecular disintegration of character takes place.

Not only occupation but steadiness of occupation is an important element of health. Women do a great amount of spasmodic, irresponsible sort of work. With no limitation save inclination, they go so far beyond their strength that the result is long periods of inability to do anything, and an impairment of power instead of an increase. Then lookers-on say: "Behold how women break down at work." It is the careful, systematic pursuit of some object within the reach of their possibilities, a daily conscientious offering upon the altar, that regulates the life and brings health to its functions.

Dr. Byford, in his work on Diseases of Women, says: "It cannot be too firmly impressed upon the mind of the inexperienced in the profession that formal exercise is too often no exercise at all, that it is worth little compared with business exercise. The former is scarcely ever thoroughly and perseveringly made use of, while the latter is exacting enough to be observed with the diligence necessary

to make it effective." He especially recommends gardening and botanizing to be engaged in persistently as business, by women. I, too, have often wondered why women do not more generally betake themselves to agricultural and kindred pursuits. No farmer is exposed to more hardships than a washerwoman. He never, with arms bare to the elbow, and lungs filled with hot, steam-laden air, passes suddenly into a dry, freezing atmosphere to hang up wet clothes. Yet washing is perfectly legitimate work for women. All the works against woman's education say nothing against washing.

MARRIAGE.

It is established beyond all dispute, that all the functions of the body should be exercised, and the sexual function forms no exception. The history of celibacy is very conclusive upon this point. Instead of marriage interfering with the development of woman's mind, it should be, and is, when rightly understood, a healthy stimulant to mental activity. But the one function of the body which is pre-eminently liable to abuse, is the sexual. There is no need to dwell upon this, for it is well known; but it is not so well known that much of this abuse never finds its

way into the calendar of crimes, but appears under the guise of disease known only to physicians, and not always to them. For, as I have said before, many women firmly believe that it is their mission to suffer, so they make no complaint.

PROPER AGE TO MARRY.

The question naturally arises here, "What is the proper age to marry?" If we knew nothing whatever in regard to the practical part of the question, we should say on theoretical grounds alone, that no organism should reproduce until it is itself produced. That is to say, the growing period of the body, the period of accession, should precede the period of sending off a part of itself to form an independent, separate individual, or as Dr. Carpenter says:* "It is when the growth and development of the individual are completed that the procreative power can be properly exerted for the continuance of the race." This completion is not reached in either man or woman until about the age of twenty-five years. The mistake which is made in the early marriages of women lies in supposing that menstruation is a sign of sexual development, whereas it signifies only the beginning of that development. The history of early

*Carpenter's Physiology, page 1107.

marriages is an early loss of generative power, and the deterioration of the individual. It takes at least twenty-five to thirty years for the mental and moral condition of a man to become a habit. All the grosser vices, such as licentiousness and drunkenness begin to show themselves before that time; and so of hereditary taint. Then, too, a man proves his capacity or incapacity for the care of a family by the kind of care he has taken of his own affairs. If he has not acquired habits of industry and economy during the first twenty-five years of his life, it is fair to infer that he will never acquire them. The few exceptions are not worth mentioning.

WOMAN'S INSTINCT.

The unerring instincts of woman have been an eloquent theme for those who do not know what they are talking about. Such passages from Dr. Naphey's "Physical Life of Woman," as the following, are calculated to mislead: "There is a mysterious instinct in a pure-minded woman which is beyond all analysis, a tact which men do not possess, and do not readily believe in; at such a crisis this instinct saves her. She feels in a moment the presence of a base, unworthy nature, an unconscious repulsion is manifest in her eye and her voice." The facts are that

women generally do not know anything whatever of the men they marry, and their unerring instinct is quite as likely to lead them into the arms of a villain as of a saint. Knowledge better than instinct serves a woman in the choice of her husband, and it is a want of this knowledge that fills column after column of the daily press with the stories of innocent girls betrayed.

PERSONAL HABITS.

Though I have mentioned many of the subjects that come under this head, yet they are all of such great importance, especially to the woman who expects to become the head of a family, that they will bear many repetitions.

THE CARE OF THE SKIN.

Strange as it may seem, cleanliness is not a common virtue, even among the better and best classes of society. It is really surprising to find how many there are who do not wash the entire surface of the body every day; anything less than this is certainly unclean. We are surprised and disgusted when the impurities of the air we breathe, and the water we drink, are exposed to our view. We should be still more surprised were we to see the impurities which should be, but are not, cast off by the skin. It is only of late years that the minute structure of the

skin has been studied, and now this organ ranks as one of the most important of the body, A healthy, active skin is just as necessary as a healthy liver or kidney—indeed, we often find the skin trying to do the work of both these organs, especially the kidney; so it is frequently called the complement of the kidney. In cases where there is a suppression of urine, the characteristic odor may be detected in the perspiration. A free action of the skin is one of the best ways of relieving the bad action of the kidney.

THE BODY COMPARABLE TO A FURNACE.

So far as many of its functions are concerned, the body may be looked upon as a furnace, into which fuel must be placed, and from which ashes must be taken. In order that the fires of life shall burn brightly, it is just as important that the ashes shall be taken up as that the fuel shall be supplied. When we see the fire burn we can't tell just how it is that the oxygen of the air unites with the carbon of the fuel. We call the process oxidation or combustion. Nor can we tell just how the oxygen of the blood unites with the worn-out tissue of the body. We do not pretend to say that this is all of life. The process by which the fuel or food is taken up and made into new tissue, is one we cannot solve. No more

can we tell how the particles which form the wood and coal were selected from the ground and the air, and made into trees. The process by which the old material is torn down and converted into its original forms is the same as the burning of the fuel; and if the waste is not taken up, it closes up all the flues of the furnace, the myriads of tiny tubes that channel the body. Over and over again have I seen patients who are complaining and haunting the offices of doctors, year in and year out, who need most to be thoroughly cleaned, and then to be kept clean.

Michelet makes the statement that for one thousand years no one in Europe used the bath. Dr. Lyon Playfair says that "it is no wonder that the epidemics of the middle ages cut off one-fourth of the population; no wonder there was spotted-plague, black-death, sweating-sickness, dancing-mania, mewing-mania, biting-mania, and other terrible epidemics. The emotionalism so much cultivated in those days had much to do with the manias mentioned; and even at this time, were there less abhorrence of water and soap, and more rational than emotional training among all classes, death and disease rates would be reduced to a minimum."

BATHS.

For those who react well from water, nothing is so invigorating as a cold plunge bath in the morning. It starts up the circulation upon the surface and in the extremities, and keeps it bounding all day. For people who are naturally sluggish, it is the best tonic in the world; but there are persons who do not react well from a cold bath, and it never should be taken when the body is overheated or overtired. One can not be too guarded on this point. I know personally a young patient who was paralyzed in both sides of his body from taking a cold plunge bath when he was very warm and very tired.

If the lips and finger nails are blue, and the skin has a "goose-flesh" appearance upon coming out of the bath, one had better stay out of it altogether. These are signs that reaction has not taken place. The first shock or chill on entering the bath should be promptly followed by a glow of warmth. If it is not, then hot drinks should be taken and friction of the skin should be kept up till the glow is felt.

A salt sponge-bath, however, can be tolerated by the most delicate person. Let the form of the bath be what it may, the body should in every instance be thoroughly dried. In delicate subjects, and during

cold weather, a flannel blanket or wrapper is the best material for drying the body. After the moisture is all absorbed a Turkish towel or flesh-brush may be used to stimulate the skin by friction. The value of the sun to the health of the body can scarcely be overestimated. So far as we know the sun is the source and sustainer of all physical life. "Let there be light!" meant "Let there be life!" That the Creator might have ordained some other way is possible, but it is enough for us to know that He did not. The body of invalids should be daily exposed to the morning sun. The blue glass mania had in it just this element of good: it made some people sit in the sunshine for the first time in their lives. In reference to this whole question of the influence upon the human animal, of the air, sunshine, and the blessed rain, all of which human habitations so successfully shut out, I have this to say: Civilization and Physiology are in many points incompatible. The sounds, the sights, the competitions, the ambitions, etc., of crowded populations, should be completely broken up, at least several times in a life. The individual who wishes to hold his own against these wearing-away forces should get back into the lap of mother earth as closely as possible, and there renew

the springs of his life. This means literally going back to his native home, and rejoining his kinsmen, the earth, air, water and sun. Had I time I could cite cases of those doomed to die whom I have advised to turn "tramp," and literally forage for food. I have started them off to Denver, or some other remote point, with simply a supply for great emergencies, making them depend upon the ground, the woods and the streams for their rations, sleeping in tents, and with special instructions not to see a market quotation or a newspaper—no reading allowed—and they have returned in a few months with "night sweats all gone," voracious appetites, and such a capacity for breathing that they "cannot sleep in a bedroom."

I believe it would be well to thus interrupt the tension of civilized life every five or ten years, according to the constitution of the individual. This does not mean to dance and dress at the springs or sea shore, or to chase about Europe for three months, at a break-neck speed, but to go home to our mother.

DRESS.

So much has been written upon this subject, I would rather say nothing whatever concerning it. Within the period of my own observation there has

been very much improvement in the dress of women; but still there is room for much more. From their mode of dress and other relaxing habits, women create a form which they are continually trying to change. The corset and the weight of the skirts so press upon the muscles of the body as to make them lose tone; they become stretched, as it were, and so remain—feeling doughy and flabby to the touch; or the muscle fibre may shrink and shrivel under the pressure and sluggish circulation. When I remonstrate with my patients, they invariably tell me their corsets are not tight. The fault of the corset does not lie so much in its tightness as in the impediment it forms to perfect circulation and respiration. Few people are familiar with the mechanism of breathing. They do not know that the external muscles of the chest and abdomen are a large part of that mechanism, and everything that enfeebles these muscles must correspondingly weaken the breathing capacity. The breathing power has been taken as the measure of the life power—hence it is called the vital capacity; when it is low the other bodily functions are correspondingly low.

Another great source of trouble to the circulation is the manner of dressing the feet and limbs. The

shoes made with elastic gores at the ankles are fortunately fast disappearing from the shops. They were a fruitful source of cold feet and swollen veins. The elastic garter, or any form of garter that binds the leg, is a great obstacle in the way of the return of the blood to the heart; at the best it has to work against gravity, and its return should be helped instead of hindered. I have elsewhere spoken of the shape of the shoe—how impossible it is for the spine to maintain its true position unless the weight of the body rests upon the arch of the foot.

The manner of clothing the body at night, especially in changeable climates, is of great importance. Many are in the habit of removing the flannel which is worn during the day, and replacing it by a cotton garment at night. This is bad practice. While the same garment should not be worn day and night the material should not be changed. The temperature of the body naturally runs down at night, and the surface is much more liable to chill than when the person is taking active exercise. The manner of clothing the bed is likewise of great importance. The sheets should be thoroughly dried, and the bedding daily exposed to the sun and the air. It is a risk to one's life to sleep in a bed that has been made up for

any length of time in a room that is not open to the sun and air daily. A guest chamber is often a vestibule to the grave. Especially should travelers be careful in regard to their beds. The heavy linen used for sheets and pillow cases in hotels is liable to retain moisture. This is particularly noticeable in Italian hotels. The buildings in Italy are themselves dark and damp. Travelers there spend their days in the hot sun, and their nights in damp beds, walled in by ancient stone on all sides, even to the floor. Their obituaries, with characteristic truthfulness, tell us they died of Roman fever.

THE WIFE.

Thus far I have considered the condition and training of the child and the girl rather than the wife and mother; though the general principles of health which have been suggested are applicable all through life.

THE PROPER TIME FOR MARRIAGE.

Having reached the proper age, and found the proper person, the question arises, is there any choice as to the time of marriage, both as regards the time in the year and the time in the month. If marriage were founded upon instinct alone, spring would without doubt, be the proper season, as it is the mating

season of the lower animals, and the period of the greatest activity in the vegetable kingdom. There is doubtless a principle here that pervades all nature—the rythmical wave of reproduction is at its height. But in true marriage there should be other considerations besides the gratification of the sexual instinct; besides in man there is no season of the year when the sexual instinct is absent—hence marriage is proper at any time.

As to the time in the month, the middle of the menstrual period is to be preferred from motives of delicacy, as well as for physiological reasons. It is not desirable that conception should take place immediately after marriage. There is every reason to believe that the mental and physical condition of the parent at the time of conception is stamped upon the embryo; therefore it would be better for conception not to take place until the excitement and anxiety that are usually attendant upon marriage have passed away, when the body is rested and the mind tranquil. And here let me say that the usual preparations before marriage, and the ceremonies of the occasion itself, are enough to induce nervous prostration in the strongest—to say nothing of the wedding journey, which is a refined species of torture to a delicate,

sensitive woman. When we consider the true purpose of marriage, then only do we comprehend the criminal folly of a preparation which includes everything but that purpose.

CHAPTER IV.

THE HAPPINESS OF TRUE MOTHERHOOD.

In mercy to the unborn child, to say nothing of the outrage upon the mother, no wife should ever be compelled to act against her own desires in her sexual relations. If woman has an inalienable right in this world, it is just this. Granted that a woman in accordance with her own desires is to become a mother; then, is her happiness the purest and most sacred on earth. It has in it more than the mere mother instinct; the lower animals have that to a marked degree. Superadded to this is a mental and spiritual delight for which the brute mother has no capacity. If the quickening of the spring-time were a conscious power, it might express the spirit that pervades a woman's being, when she is willingly, therefore joyfully, becoming a mother. Alas! that so few mothers should ever be able to realize the exquisite delight which God intended should be theirs. Bad health, neglect, unwillingness, and many other causes turn this season of joy into one of actual, unmitigated

wretchedness. The physical condition always has a great deal to do with the mental state at this time. Women who are in average good health generally feel a great deal better during this period—but so few can lay any claim to good health, that obstetrical writers have placed among the natural signs of pregnancy things which belong to a pathological condition—such as nausea or morning sickness, capricious temper and appetite, mild insanity, etc. When it is assumed that menstruation is a sickness, it naturally follows that pregnancy is a much greater sickness.

SIGNS OF PREGNANCY.

The first thing that attracts the woman's notice is the cessation of the monthly discharge. There are cases in which the discharge takes place regularly during pregnancy, but there is no doubt the condition is one of disease. On the other hand, menstruation may be arrested by causes other than pregnancy; but when a married woman in good health and regular habit ceases to menstruate, the probabilities are she is pregnant. Other probable signs are the enlargement of the breasts and the abdomen. What is known as quickening, which is the motion of the child in the womb, is thought to be, by women who have

borne children, a positive sign; but as this motion may be so closely imitated by the movement of gas in the intestine, it cannot be considered positive evidence. The only sign upon which the physician dares to make a positive diagnosis, is the sound of the foetal heart; but as it takes some skill and experience to find out and recognize it, when it is found it cannot be made available to the woman herself in considering her own symptoms.

VALUE OF THE BATH, FRESH AIR AND EXERCISE, IN OVERCOMING NAUSEA.

One of a woman's difficulties at the beginning and during pregnancy is constipation of the bowels, and to this fact alone is due much of the nausea and derangement of the circulation, or nervous system, or both. Pregnancy acts upon the stomach and bowels much as sea-sickness affects certain people. I know of nothing that will correct this difficulty so surely as proper exercise in the open air, and the judicious use of the bath.

My own experience in sea-sickness has left no doubt in my own mind as to the efficacy of exercise and water. From being a most helpless invalid on the first trip, I became quite a good sailor on the second, by means of a salt water bath every morning.

This was followed by a brisk walk on deck resulting in a good appetite for breakfast. The regular morning bath should be continued all through pregnancy—cold or tepid, full or sponge, whichever by previous habits has been found best to agree.

RELAXATION OF THE PELVIC MUSCLES.

During the last two months of pregnancy, a warm salt hip bath at night, will greatly relieve the rigidity of the pelvic muscles, which must relax to a great extent before the child can be born.

Inunctions of oil after the bath also assist greatly in increasing the pliability of these muscles. I believe that a large proportion, if not all the ruptures that are caused by childbirth, save in cases of malformation, might be prevented by previous care; and if these lacerations could be prevented, then much of the ill health of mothers could be saved. The records of the private hospitals, which I have taken some pains to investigate, show that these lacerations are to blame for at least half the cases that go to these institutions for relief.

Plenty of fresh air and sunshine; and a fair amount of exercise are essential to the health of both mother and child. Undoubtedly, the best kind of exercise is walking.

DIET.

The diet should be simple and wholesome. Ripe fruits are especially desirable, on account of their laxative qualities. The appetite should not be forced beyond its usual capacity. It is a mistake for a woman to suppose that she must eat so much more than the ordinary amount. All stimulants, especially the alcoholic, should be avoided; they are injurious to the healthy, and to the sick are of very doubtful value, excepting in cases of great emergency. The best mind of the medical profession is almost a unit against the use of alcohol as a beverage or tonic during pregnancy and nursing. It has been a great fashion to prescribe beer for nursing mothers. There are some elements in the beer which do increase the amount of milk, but the same elements are found to a greater extent in good nourishing food, rich soups and chocolate. Few conscientious, intelligent mothers are willing thus to convert themselves into a kind of brewery. The alcohol in the beer will find its way into the child's system. Who shall answer for the consequences? The mothers themselves are by no means proof against the appetite for alcohol. There is always danger in the continued use of any of this class of stimulants.

DRESS DURING PREGNANCY.

It seems almost needless to say that no clothing should hang from the waist; no elastic should constrict the ankle, or any part of the leg. The uterus itself is very apt to press upon some of the larger veins, and obstruct the free flow of blood through them back to the heart. This causes the frequent swelling of the feet and limbs that we see in pregnant women. When this condition is accompanied by decrease in the quantity of the urine, or very great change in its color, it is best to consult a physician, as there may be some serious trouble with the kidney.

SHOCKS, LONGINGS, ETC.

Women, who from infancy are trained to think of themselves as invalids, are very apt to become such by the time they have passed through the feverish excitement attendant upon fashionable marriage, and have entered upon their first pregnancy. They have heard of longings, and so they begin to cultivate them as a part of the regular programme. The usual result is to fix the mind upon something impossible to get, and then worry lest the child should be marked by that impossible thing.

HOW THE MIND OF THE MOTHER AFFECTS THE UNBORN CHILD.

It is beyond all controversy that the mother's mental condition can affect the physical condition of the unborn child. It has been argued that this is impossible, inasmuch as there is no nervous connection between the mother and the fœtus. The same argument would apply to the ovum or cell before it leaves the ovary. It is a more or less independent body from the very beginning. It contains no blood-vessels and no nerves, and yet who shall say that the ovum is not impressed by the mother before it escapes from the ovary. It is always in contact with the mother's tissues, and from them it is capable of drawing, not only its nourishment, but its *morale*, so to speak. That which determines what quality of embryo is to be formed from the cell may be only a modification of the great process of nutrition. If this be so, then the power to modify belongs to the mother; she acts upon the cell from its very incipency, before it becomes impregnated even, in a manner which not only imparts to it hereditary characteristics, but impresses upon it her passing condition; and so women whose nervous system is in a state of unstable equilibrium, are constantly in danger of de-

forming their children both in body and mind. By deformity I do not always mean an actual monstrosity in body, or idiot in brain, but there are a thousand gradations between such conditions and an harmonious development.

It is a rare exception to find a well balanced organization, and it has come to be an accepted fact that there are some weak points in every constitution. Up to this date, pre-natal influences have not received the attention they deserve.

Aside from the reference to mothers' marks as so many old women's stories, to which no credit should be given, medical writers have well nigh ignored the whole subject. It is doubtless true that the so-called marking of children is, for the most part, an idle tale; but I think experience proves that there are very few popular superstitions that do not have their foundation in truth. The weight of authority seems to prove that the condition, mental and physical, of both parents, at the time of conception, is transmitted to the embryo, and that any continued impression on the part of the mother is likewise transmitted. It is not every passing emotion that remains, but only those that are most profound and prolonged. While I believe it is only

these latter that are able so seriously to pervert nutrition as to cause an actual deformity, I also believe that the passing conditions of the mother have much to do with the stableness, or unstableness of the child's organization. Upon what other ground can we base the great differences between children of the same parents? The outcome of all this should be self-control among women. A recent writer* on epilepsy makes this statement: "The existence of hysteria, . . . or even simple nervousness in the parent, may be transmitted into epilepsy in one of the descendants." It is all very pretty and womanly to be hysterical, but it is not pretty or womanly to disfigure a child. Possibly no one, man or woman, can prevent the occurrence of a sudden shock—there are calamities which can wring the stoutest hearts; but no man or woman need necessarily let the mind forever dwell upon, or recur to that calamity; and herein is the great blessing and safeguard of active employment, something to do.

HOW TO PREVENT DEFORMITIES.

The only cure for timidity of which I know is work, and plenty of it, and of a kind which does not permit self-brooding. I have seen the most timid wo-

*L. Putzel, M.D. *Functional Nervous Diseases*, p. 62.

men grow brave and courageous under the influence of healthy, useful occupation, and I have seen those naturally courageous grow timid and hysterical under idleness, and the foolish sympathy of friends.

The prevention, then, of deformity as far as in us lies is persistent diversion of the mind from the object which may have produced the nervous shock. If the bodily functions are in a healthy condition, there will be little difficulty in controlling the mind; but if the system is debilitated, especially if the excretions of the body are not thrown off, or if the liver is torpid, the mind will be more or less uncontrollable.

THE CARE OF THE BREASTS.

Generally speaking, if women have had proper exercise, proper bathing and proper dress, there will be no trouble with the breasts. The habit of wearing heavy padding is very injurious. Any constant pressure has a tendency to depress the nipple and shrink the tissues of the organ.

During pregnancy all pressure should be removed, and mild friction with salt water should be used daily. If there is a natural depression of the nipple, it can be greatly modified by the application of a shield from which the air has been exhausted. An empty

bottle which has been warmed in hot water will answer the purpose of a shield, if its mouth is applied immediately to the nipple. This should be done frequently from day to day, until the nipple is well drawn out. To prevent the tenderness and cracking which often cause so much suffering, an application of the tincture of myrrh should be made to the parts.

GATHERED BREASTS.

The condition known as "broken breast" I have come to look upon usually as the result of gross neglect. Every attempt at what is known as "caking" of the breast should be immediately thwarted by gently rubbing the part till the tissues become perfectly smooth again. If no lumps are allowed to form there can be no such thing as "milk abscess." There is never any necessity for applications externally, or medicines internally, if the milk is prevented from accumulating and hardening in the ducts, and if the circulation in the blood-vessels is kept free. If a severe cold has been taken, and manifests itself by a sudden swelling and reddening of the gland, the services of a physician may be required, but, in general, anything that will produce a copious perspiration will restore the circulation, and thus relieve the congested part. To prevent the patient from taking cold after a

general sweating, the surface of the entire body should be sponged off under the bed-clothes with strong salt water, and flannel instead of cotton or linen should be worn next to the skin. Patients frequently tell me they cannot wear flannel, but I find the "cannot" in many cases is only a whim; the coarser flannels do irritate, but the fine silk flannel, or all-silk underwear, can be comfortably worn next the most delicate skin. Then, too, the irritation frequently comes from the tightness of the garment; it should always be loose-fitting.

EXPOSURE OF THE BREAST AT NIGHT.

Many mothers expose the breast to draughts at night by falling asleep while the child is nursing. If the child is taught regular habits from the very beginning, there will be little or no necessity for night nursing. The habit of nursing a child all night is pernicious in its results to both mother and child; nor should the child sleep on its mother's arm. It should have a crib, with soft, nestling wraps, over and under it, so as to retain the heat of its body. Children put to sleep in this way for the night are less wakeful, because they are not disturbed by the every motion of the mother, to say nothing of the dangers they escape of being smothered to death.

SIGNS OF LABOR.

At the termination of about forty weeks of pregnancy, labor may be expected at any time. A good rule is to count backward three months from the last menstruation, and add seven days to the day of the month. For example, if the date of the last menstruation was the first day of February, the date of labor would be the eighth day of November.

One of the first things that attracts the attention of the woman is a sense of decrease in weight of the tumor. This is caused by the uterus sinking down into the pelvis, instead of pressing up against the heart and lungs, as during the latter months of pregnancy. This change in position may take place as early as two weeks before labor really begins. The most important symptom is the appearance of a discharge vulgarly called "a show," which consists of a mass or plug of mucus tinged with blood. When this appears, no time should be lost in sending for a nurse, unless she be already in the house. It would be well if every wife could be under the care of a competent nurse during at least the last two weeks of her pregnancy; but wives are often placed in positions where they must help themselves, or give instructions to some one who is untrained.

PREPARATION OF THE BED.

They should particularly know how to prepare the bed, and their own clothing. For convenience and cleanliness a rubber sheet is indispensable. The bed should be made up as usual, except that a thick blanket or quilt should be placed beneath the lower sheet. On top of this lower sheet a rubber should be placed; and on this again a blanket, or another sheet. If a sheet only is used the cold rubber may be disagreeably felt. This arrangement does not necessitate the making up of the bed after the birth of the child, because as we shall perceive, the soiled clothes can all be removed without disarranging the bed.

THE MOTHER'S DRESS.

A woman's dress should be such as not to require complete undressing after labor. The night-dress should be short or open in front to the bottom, because of the ease with which it can be taken off and on. The chemise is an awkward garment, and had better be dispensed with. A loose fitting under wrapper of raw silk, or flannel, is the best thing to wear next the skin. Even in summer time it is desirable, because it keeps up a gentle friction of the surface, and equalizes the temperature, which is a very important item in the care of lying-in women. This

under-garment and the night-dress, too, can be folded up smoothly above the hips, while the lower part of the body may be dressed in loose, open drawers, and long stockings, which extend well above the knee, and, if desirable, a skirt fastened loosely at the waist. All these lower garments can be removed by pulling them downward. Then, after washing and bandaging the patient, the night-shirt and night-dress may be adjusted without the fatigue and inconvenience that a change of garment would cause. A safer and simpler kind of dress would be a single garment of soft flannel. Under-shirts are so hard to get off and on, and the flannel night-dress would answer every purpose. If the patient wishes something more dressy, a handsome dressing-sack may be worn over the flannel.

Pain is so universal that even scientific authorities have adopted the name "pain" for the contraction of the muscles concerned in labor; not only the name but the fact of pain has become classic; nay, more, it is even invested with the authority of Divine decree, so that it is rank heresy to affirm that it is unnecessary and unnatural. If a woman who does not have pain during menstruation is in an abnormal condition, how much more abnormal must the woman be who does not have pain during labor. Travelers

among savage tribes tell us that women do not suffer at all in childbirth. Only lately a missionary from South Africa, in a lecture before one of our medical colleges, made the statement that he, himself, had seen women go into the woods after a bundle of sticks for the fire, and return in a short time bearing the bundle of sticks on one arm and a new born child on the other. There is, of course, a wide margin between this brute-like condition of the savage and the enervated invalid condition of the lying-in woman of civilization.

We see the same enfeebling influences resulting from the domestication of animals. When the blood becomes vitiated or impoverished by indoor life, the nerve and muscle fibres must both become impoverished; pain is the outcry of this poverty, the voice of debility. Even though the blood be too full, and too rich, the result is still the same debility. It is not to be wondered at that the muscles and nerves cannot perform their part in the mechanism of labor in a natural manner; but as we cannot consider woman's condition as it might be, we must consider it as it is.

The first pains that are usually felt are known as "false pains," and they arise from the contraction of the muscles in various parts, such as the back, abdo-

men and bowels. The dilatation of the muscles that close the mouth of the uterus constitutes what is known as the first stage of labor; and is, frequently, the most prolonged and trying period. If it has continued beyond twelve hours, it is usually the sign for interference. Hot hip baths and hot injections assist very much in shortening this period, and in alleviating the pain. Now that the condition of the civilized woman is one of art, and not of nature, it is therefore the duty of a physician to avail himself of every appliance of art for her relief.

USE OF CHLOROFORM.

One of the greatest blessings in the way of obstetrical art is the use of chloroform. It is especially advantageous in the first stage of labor; aside from the relief it gives from pain, it helps greatly in the relaxing of the muscles, so that labor is shortened by many hours. Although there are no cases on record of death from chloroform during labor, yet it never should be given but by the advice and in the presence of a competent physician; nor should the patient ever be rendered fully unconscious, excepting in the use of instruments. At the beginning of each contraction or pain, a handkerchief slightly wet with chloroform should be placed to the nose, and the pa-

tient instructed to take a deep breath; enough of the spirit will thus be inhaled to deaden the pain. Since the discovery of the nitrite of amyl, (which counteracts the effects of chloroform), I consider the moderate use of chloroform perfectly free from danger in the first and second stages of labor; but it never should be given in the third stage.

THE THREE STAGES OF LABOR.

Labor is divided into three stages: The first is occupied by the opening of the mouth of the uterus; the second by the expulsion of the child; the third by the expulsion of the after-birth, or placenta. It is during and after this last stage that hemorrhages are likely to occur; therefore chloroform should never be used.

HOW TO ACT IN CASE OF HEMORRHAGE.

In connection with this subject, and for the benefit of those who may be placed in an emergency when a physician is not at hand, I would say that for all uterine hemorrhages it is safe to use hot water injections into the vagina in great quantities, and as hot as can be borne; not warm water, for that would do more harm than good, but VERY HOT water. This is a remedy which costs nothing, and can be obtained under almost all circumstances.

Many authorities advise the use of ice and of cold water, but they are always disagreeable, and often dangerous, to the patient—while the hot water is really grateful to the patient, and without any dangerous results. Every woman should know the danger of hemorrhage at such a time, and should have in mind the knowledge of something to do. Many a mother's life might be saved by the prompt use of so simple and safe a remedy as hot water, by those who are hopelessly and uselessly wringing their hands around her dying bed.

Another ready method is to grasp and hold the uterus with the hand on the outside of the abdomen. It can be felt like a round, hard ball, when it is properly contracted, and when it is not thus felt, there is always danger of hemorrhage. By firmly grasping the middle of the abdominal wall below the navel with the hand open and fingers spread out, and then pressing downward toward the feet, and at the same time backward towards the backbone, the uterus can be made to contract. Just here let me say that no midwife or nurse should ever be allowed to pull at the cord in order to remove the after-birth, or as some of them express it, "to keep the after-birth from going up into the stomach!" The after-birth should

never be pulled away. The pressure by the hand outside, as I have described, will push out the after-birth, which is much safer than to pull it out.

BANDAGING.

The question of wearing a bandage is one that interests women, as it is necessary to prepare it beforehand, if it is to be worn. I think it necessary, but not for the purpose it is usually supposed to serve, namely, the prevention of hemorrhage. If the muscles of the uterus are not firm enough to contract of themselves, the pressure of the bandage will not help the case. The value of the bandage is in giving support to the abdominal muscles, thereby helping these muscles to regain their proper size. Besides, the bandage gives a feeling of comfort to the patient, and for that reason alone should be used.

REST AFTER LABOR.

The savage woman may be able to gather wood and resume her march after childbirth, but the woman of civilization needs absolute rest. No time should be lost in procuring for her a quiet, refreshing sleep, and nature usually adjusts this matter without the intervention of art.

In regard to the length of time a woman should remain in bed after confinement, no positive rule can

be given. Each patient is a law unto her-self; no two can be treated exactly alike. The physician in charge must be the judge of the case. No woman is fit to be on her feet until the uterus has become very much reduced in size, and the only safe way is to make a thorough examination of the organ before allowing the patient to get up. "Getting up too soon" is the foundation of many an invalid life. The daily use of the hot vaginal douche, containing a drop or two of carbolic acid to the quart of water, helps to keep the parts clean and free from any inflammation, and thus favors the return of the uterus to its normal size. A large part of child-bed fevers come from want of care in keeping the parts well washed, and the surface of the body well sponged in warm salt water. The vaginal douche or injection should be given with great gentleness. No force should be used, lest the water be driven into the cavity of the uterus, and thus produce great pain, and possibly inflammation. I have known great harm to be done in this way.

I would especially warn patients, even those who are feeling well, against suddenly rising up in the bed. This sudden motion is sometimes followed by fatal

syncope of the heart. The upright position should be assumed gradually, never suddenly.

THE CARE OF THE INFANT.

As a general thing the immediate care of the infant is not so important as the care of the mother. If the breathing is well established the child can be wrapped in soft, warm flannel, and be let alone, if necessary, for some time; but if there is any obstruction of the breathing, no time should be lost in removing it. If a physician is at hand, he will know just what to do. But sometimes children are born before a physician can be found, and there are a few simple things which might be done immediately, and thus save the life of the child.

HOW TO MAKE THE CHILD BREATHE.

If the cord is still beating, which can be ascertained by holding it firmly between the thumb and finger, it is better not to cut until the beating stops. Then it should be tied with a small strong cord about two inches from the navel; for purposes of cleanliness it is better to tie another loop about an inch beyond the first, and cut the cord between the two.

Plenty of water, both hot and cold, should always be at hand, and if the child does not breathe it should be plunged first into the hot and then into the

cold water. Frequently there is a quantity of mucous in the mouth and throat which obstructs the passage of the air. The finger should be wrapped in a soft, clean cloth, and passed well into the mouth, swabbing out whatever may be there. This movement of itself frequently starts up the respiration.

CARE OF THE CORD AND BANDAGING.

A great deal has been said and written about the care of the cord and the use of the bandage. Some practitioners say they neither tie the cord nor use the bandage, and that they have excellent results, but I do not think either would be a safe plan without the presence of a physician who is experienced in the method. While the old practice of tight bandaging is bad, none at all seems very bad to those unaccustomed to it. The cord should be folded in a soft, clean linen cloth, and bound loosely up against the body by a soft flannel bandage. If a bandage is used at all, flannel is better than linen, because of its power to keep the surface evenly warm.

INFANT DRESSING.

There is a great change for the better in the mode of dressing infants. The tight bandages and close, unwholesome caps have well nigh disappeared; though in some country districts we find the fashion of low

neck and short sleeves still prevailing. The first garment required after the bandage is a soft napkin, the ends of which can be fastened by means of safety pins to the bandage, and thus prevent the latter from slipping up under the arms. The upper part of the body should be clothed in a high-necked, long-sleeved woolen shirt; those which are made upon needles are the softest and best fitting; over this may be placed a long flannel skirt, the body of which should be made with shoulders like the waist of a dress. The bottom of the skirt can be folded up loosely over the child's feet, protecting them from the cold. Soft, knitted woolen socks are also a great protection for the feet. Much of the colic from which infants suffer is in consequence of cold feet. The circulation of a young child is always feeble, and the surface of the body should never be allowed to chill.

For my own cases, I advise the simple mode of dressing recommended by Prof. Byford, in his work on Obstetrics. The cord is merely wrapped about with a soft bit of linen, which is fastened by a tape wound around the whole length of the stump. This cloth may be moistened by a little vaseline to prevent it from sticking. The only object in thus wrapping the cord is to keep it from contact with the skin

and clothing. There is no real necessity for the bandage. If it is tight enough to keep in place it may do harm, and if it is not tight it is simply in the way. However, I always recommend the use of a flannel bandage across the abdomen of children that have any form of summer complaint. The only other garment recommended by Prof. Byford, beside the napkin, is a long flannel night-gown, fastened close up about the neck by a draw-string of tape. This is certainly all the dressing the child needs for the first weeks of its life. It is both comfortable and healthy. A mother should never sacrifice either the comfort or health of her child for the sake of mere looks.

THE BABY'S BATH.

I am convinced that too much soap is used in the infant bath. Before the first bath the body should be well oiled; pure lard is the best, but olive oil will answer. It would be well to let the child lie in this oil for some time. Soap should be used only in sufficient quantities to keep the body clean, and then it should be of the purest and mildest quality, and not too highly scented. Much of the chafing of the skin in infants comes from the too frequent use of soap that is too highly alkaline. The water should have a pleasant heat, and, as the child grows older, a little salt will

add greatly to its efficacy. The child never should be kept long in the water, not to exceed five minutes; two or three plunges, enough to wet the entire surface of the body, are sufficient, and then it should be wrapped in a soft blanket and dried without exposing the body to the air. This will insure good circulation and cleanliness, the two objects of a bath.

An occasional oil bath, especially for feeble children, is a most excellent thing. The preparations from coal oil, known as vaseline and cosmoline, are especially useful for this purpose, as they do not become rancid. The parts of the *nates* that are so liable to become chafed from the frequent washings and excretions, can be well protected by the use of these oils.

SUN BATHS.

Sun baths, too, are very beneficial to children, and adults likewise. The whole surface of the body, excepting the head, should be exposed directly to the rays of the morning sun. Of course the temperature of the room should be 75 to 80 degrees, and care should be taken to prevent drafts.

FOOD.

The first food that should be given to a child is the mother's milk. It contains a substance which produces an evacuation of the bowels. No sweetened

water, catnip tea, or any other "stuff," should for one moment be thought of. There is no objection to giving young children a few drops of cold water. Care should be taken, however, that the water is pure; if it has been standing uncovered in a room any length of time, especially at night, it is not fit to drink, for any liquid substance will absorb the bad gases in a room. As to the question, "How often shall a child be fed?" it may be stated, in general, that, during the whole infant life, there is necessity of frequent feeding, on account of the rapid growth that is going on; but from the very first regularity of feeding should be established. Every two hours is often enough for the youngest child, and the interval can be increased gradually to three.

CHAPTER V.

THE BEST FOOD FOR CHILDREN.

Good bread and milk is, by all odds, the best food for children. The different kinds of grain are all healthy, but I am inclined to think more care should be taken in the preparation of oatmeal. The barb of the oat is very apt to get into the meal, and it may be the cause of a great deal of intestinal trouble. According to the authority of Doctor Watson, the people of Scotland and Lancashire are especially prone to intestinal accretions, and the nucleus of these masses is found to be the beard of the oat. These accretions are said to resemble the masses that are found in the sieves of the oatmeal mills. To guard against this, oatmeal should be well cooked and well strained. It is better for young children to take all

kinds of animal food in the form of a light soup or broth, not the rich gravy which is so commonly served as soup.

The vegetables that are fit for children to eat may be prepared in the form of a soup, such as rice, barley, potatoes, beans, tomatoes, and even onion soup is very nourishing when properly made. By using chicken, beef or mutton for the broth, and a single vegetable for the thickening, a new soup can be brought on the table every day, so that the child need not grow tired of the same thing. The vegetable should not be put into the broth in large pieces, but finely pulverized and rubbed through a sieve, so that the soup has a smooth, even body.

Pastry should never be allowed, and no cake except plain, sweetened biscuit. If children were thus fed there would be fewer stomach and intestinal troubles. Heat is not always the cause of these troubles in the summer time. The irritation is there all through the season, but the heat so prostrates the child's nerves that they can no longer resist the excessive strain, and so the nervous symptoms in these summer troubles are nearly always the most prominent.

The question of the artificial feeding of infants is one of the most difficult that the mother and physi-

cian have to decide, for the reason that there is such a difference in the digestive powers of children, even of the same mother.

It does not always follow that the mother's milk is the best food for the child. If the mother is sickly, especially if she has scrofulous or cancerous blood, the child's chances are far better on artificial food. In general, if an infant does not thrive well, the mother's milk should be tested. Often a simple inspection of the milk will show that it is poor and thin; but it is better to have it examined chemically and microscopically by the family physician. Sometimes, by improving the nutrition of the mother, the quality of the milk can be raised to the proper standard; but if there is a bad constitution at the bottom of the difficulty it is better to feed the child.

Cows' milk seems to be the most available of all the artificial foods. Even city cows may be so cared for as to give good healthy milk. A good breed of cow should be selected, and quality rather than the amount of milk should be the test. Nearly all housekeepers can judge of the quality of the milk by simply looking at it after the cream is set. If the body of the milk is thin and blue, then it is lacking in the essential ingredients. If the cow cannot be pastured she

should be kept in a clean, dry, well-lighted, well-aired stable, with plenty of pure water and good oats. Not a great amount, but a most excellent quality of milk is made from oats; it is full of the nitrogenous, that is the tissue-forming, element. The difficulty in milk feeding is to prevent this nitrogenous part, caseine as it is called, from gathering in hard, cheesy lumps in the child's stomach. It is found that the addition of arrowroot and a little salt will prevent the caseine or cheesy part of the milk from collecting in curds. This food requires special care in its preparation. The arrowroot—the Bermuda is the best—should be made first into a very thin gruel, with water and a few grains of salt. Great care should be taken to keep the gruel from scorching. This can be done by cooking it in a porcelain kettle, or in a vessel of boiling water. After it is thoroughly cooked and partially cooled, milk, as fresh as possible, should be added until the mixture has the appearance of milk instead of starch. This can be fed by bottle or spoon. If a bottle is used, great care is necessary in keeping it perfectly clean. If it is desirable to sweeten the mixture, a few drops of glycerine are better than sugar. The preparation of milk requires so much care that, for general use, I prefer some of the foods

that are found in the market. I find Nestle's Swiss food a most excellent preparation, chiefly because it does not require the addition of either sugar or milk—the two things which are most liable to do mischief, by not being always the same in quantity and quality. The danger is, however, that this food, like so many others, may become adulterated or counterfeited; so long as the original formula is followed it is good and safe.

In some instances I have used Kumyss with good results; but when children are really sick a competent physician should always take care of the feeding, for that is the most important point in the care of a sick child.

MIXED FEEDING.

When the mother's milk is good but insufficient, the child should not be weaned, but the feeding can be pieced out, as it were, by artificial food. Dr. Chas. W. Earle, Professor of Diseases of Children, in the Woman's College of Chicago, recommends a food of which rice-water is the basis, using from one to four ounces at a feeding, according to the age. To this rice-water is added a small amount of cream, from a few drops to a teaspoonful, as the child's stomach will bear it. To this, again, a few drops of glycerine and

grains of salt, and then adds what every physician advises—"Always give the food warm."

THE MOUTH.

One of the most troublesome things that can happen to a child is sore mouth ; and it is for the most part caused by uncleanness. The mouth should be washed out daily with a soft bit of linen, wet in cold water. Few children in private practice have such impoverished blood as to cause sores in the mouth, when it is thus kept clean. A little borax dissolved in glycerine makes a good application for the ordinary sore mouth of infants. Chlorate of potash is in very general use among mothers and nurses, not only as an external wash, but as a medicine to be taken internally. I have reason to know that the harmlessness of potash is greatly over-estimated. My attention was first called to it by the illness of a child for whom I had prescribed a solution of potash in glycerine for a slight sore mouth. The nurse discovered that the child was fond of the mixture, so she kept a rag saturated with it in the child's mouth, after the fashion of a "sugar tit." The result was a congestion of the child's kidneys; the urine became scant and high-colored; only a few drops were passed, which stained the napkin a deep reddish brown.

This leads me to speak of that abomination known as sugar tit, a fruitful source of sore mouth and indigestion. It should not be tolerated for one moment by any nurse or mother. Its use is very apt to produce wind colic, which, in turn, must be quieted by soothing syrup, and that means opium, and opium for a young child is the worst possible thing that could be given.

My answer to the question, "What can be done for colic?" is, if the child is properly fed, the bowels properly regulated, the body properly warmed, it will not have colic. The mother's milk may not agree with the child. If it throws up a hard, cheesy curd, the milk is probably at fault. This is considered under the head of artificial feeding.

To return to the question of sore mouth, from which we have diverged. If the disease does not readily yield to the borax-wash, especially if it is angry looking, or inclines to spread, a physician should be consulted at once.

TEETHING.

Intimately connected with the care of the mouth is the subject of teething. The first symptoms that the mother notices is a discharge of water from the mouth. This usually appears about the third month,

and the two lower middle or incisor teeth appear, if all is well, between this time and the seventh month; then there is a pause of several weeks, and the four upper incisors appear between the eighth and tenth month; there is now usually another rest until the child is a year old; then the process begins again, and in the next three months six teeth appear, two upper and two lower grinders, or molars, and the remaining two lower incisors; another rest of three months, and then comes what the mothers look upon as the tug of war, the cutting of the canine teeth. The lower ones are known as the stomach-teeth, and the upper as eye-teeth. "Cutting the eye-teeth" is an expression which has become proverbial in its application to certain hard experiences. The child is now fully two years old; again there is an interval until the 30th month. Between this time and the age of three years another set of four grinders appear, and these make up the twenty milk-teeth which are usually all shed by the time the child is seven years old. But all children do not get their teeth thus regularly. I have known children to be eighteen months old before cutting their teeth, and it is said that Louis XIV. and Mirabeau had teeth when they were born. If this happens a child it is not such a wonder, nor

should it give rise to any superstition, for the teeth are well formed at least four months before the child is born.

Children inclined to rickets are usually slow in getting their teeth; but if the child is otherwise perfectly well, this slowness in teething need not cause alarm.

The cutting of the permanent teeth is not attended by the irritating symptoms that are common in the cutting of the milk-teeth; but as so much of the beauty and utility of the teeth depends upon this period, the advice of a first-class dentist is desirable. It may save the individual a great deal of suffering, and a great deal of expense in later life. As to the diseases that come from teething, they require the care of a skillful physician. Convulsions are the most horrifying to mothers; but the only things the mother may do with safety are to put the child into a hot bath, and apply cold water to the head, and possibly apply a chloroform liniment to the spine.

THE EYES.

The eyes of new-born children are very apt to become inflamed. Ordinarily they need little attention beside absolute cleanliness and protection from strong light. If there is a slight redness and discharge they

may be bathed in cold chamomile tea, but on no account should any serious trouble with the eyes be tampered with by mother or nurse.

DEFORMITIES.

There is, however, one subject with which I think mothers cannot become too familiar, namely: The causes and first symptoms of diseases of the joints. I have known children to be punished for laziness and fretfulness, and sent to school, when they should have been taken up in their mother's arms and put to bed, and had that been done they might have been spared the use of a sound limb or back.

In the first place, as to the causes. I do not think these diseases of the joints are all in the blood; neither do I think they are caused only by injuries. If the child has what is called a scrofulous constitution, (and I admit the term is very vague and incapable of a close definition), the mother should be watchful for any of the signs I shall mention, because I believe there is a predisposition in such children for such diseases. In a general way, a child is scrofulous, if it is very fair, thin-skinned, and very bright, or sallow, thick-skinned and very dull. Every physician is familiar with the two types of children. It does not matter much by what name they are designated, but

in these types of children, an injury is very likely to result in joint diseases. How shall a mother know when there is danger in time to call a surgeon and save a deformity?

Deformities of the spine are of two kinds: that which bends the spine to one side, and that which bends it forward and backward. The curves to the side are very common. There are few people who do not have the hip and shoulders of one side slightly higher than those of the other. Very much of this comes from the manner in which children stand and sit in school. It is the exception to see children stand squarely upon both feet; nor do they, as a rule, sit squarely in front of their desks, but to one side, one arm, usually the right, supporting a part of the weight of the body upon the desk. It has just the effect that bending a young sapling this way or that has upon the shape of a tree: it will be crooked. If one limb is shorter than the other, the spine will be curved to one side, or the curving of the spine from the straight line makes one limb shorter than the other. The first noticeable sign is a sticking out of the shoulder blade. There is scarcely any case which may not be entirely relieved by proper surgical care. But the thing for mothers to do is to see that their

children always stand and sit straight. If the teachers are not intelligent enough to know the importance of this, they are not fit to be teachers.

The deformity most to be dreaded, however, is the antero-posterior curvature of the spine, known as Pott's disease. The symptoms of this are so obscure as to mislead physicians even, and the patient is often treated for rheumatism or indigestion. If a child is growing thin, complains daily of pains in the leg, back or stomach, and a tired feeling all over, it may mean spinal or hip disease, or both. A disease of the spine, sooner or later, shows itself by a slight protuberance, or bulging out, which, if noticed and attended to at once, may be entirely removed, so perfect are the surgical appliances now in use. If the hip is diseased, there will be a change in the gait of the child; one foot will be turned out and slightly dragged in walking, while in standing the sound foot and leg will support the whole weight of the body, the foot of the other side being usually drawn up lengthwise against the ankle of the well foot.

Any of these symptoms, especially if they occur after a hurt, should send a mother at once to a surgeon. With this end in view, it will not hurt mothers to study the anatomy of the body, so they may

know when the services of a surgeon are needed. In no place so perfectly as in the human body is it proven that ignorance is the parent of great misery and crime.

THE DEVELOPMENT OF THE BODY.

The process by which the human body is built up from a single tiny cell, scarcely discernible by the naked eye, is probably the most wonderful thing in nature. I can attempt to give nothing but the merest outline. Embryology has been carefully studied in many of the lower animals, and it is found, by comparison, that the development of the human being is very much the same. It is first observed that the contents of the little cell begin to separate so as to form two cells within the old wall; these again divide into two, and so on, these subdivisions continuing until the one original cell has become a countless mass. It has been named the "mulberry mass," because of its resemblance to the clustering form of a mulberry. Very soon these separate cells begin to run together, or coalesce; their edges become, as it were, cemented together in such a way as to form a thin membrane. At the same time it is observed that the cells begin to arrange themselves in three distinct layers, so that, instead of one membrane, three are formed. From

these three layers or membranes are constructed all the various parts of the body. From the upper one are derived the skin and all its appendages, such as the hair, nails, etc.; from the middle layer are formed the blood-vessels, muscles, nerves, bones, and most of the organs that occupy the cavity of the body, while from the lower or third layer comes the alimentary canal, which begins with the mouth and includes the stomach and bowels, making one continuous canal through the body. More properly speaking, it is the mucous membrane lining this whole canal, as well as that of the bladder and the organs of generation, that is derived from the third layer of cells; but, as the mucous membrane is the most important part of these organs, it is common to say that these organs themselves are derived from the third layer; but their muscular part, no doubt, comes from the middle layer, as do the other muscles of the body. By the folding in and folding out, by the plaiting, tucking, twisting and channelling of these three plain, simple membranes, are formed all the various and curiously shaped organs of the body. We can even go back of these three simple membranes, and the one tiny cell, to the simple elements that form that cell. We find them to be a little oxygen, carbon, hydrogen, nitrogen, a little sulphur

and phosphorus, and, later on, a little lime, iron, potash and soda—a few breaths of gas and specks of dust! These are the beginnings, not alone of human bodies, but, as far as we know, they are the alphabet of the very universe itself. There is great satisfaction in taking these few simple elements into one's hand, and from them building up, in our own thought, ourselves and all that is around us.

WHO SHALL TELL THE CHILDREN OF THEIR ORIGIN?

A question upon which I have thought a great deal, and which has frequently been suggested to my mind by others, is, whether children should be told of their origin. A better stating of the question would be—Who shall tell the children of their origin? for in these days a child who reaches the age of twelve without hearing all about it, from some source or other, is the exception. The question, then, hinges upon the source of the information, and as a mere matter of taste or preference—to say nothing of duty—it is presumable that the parent would rather give this information to the child than to have it come through a vulgar servant or low-minded playmate.

The mystery of birth makes children especially inquisitive. As soon as they begin to think at all, the fabulous stories that have been told them concerning-

it fade away with Santa Claus and his reindeers, and they are bound to know the truth sooner or later. The truth did I say? Well for every child if the truth, the sacred truth, and that only, were heard, instead of the vile, blasphemous tales that so often find their way into the minds and hearts of children. The injury thus done to the heart is of a kind that can scarcely be outlived. No doubt some of my readers will say this is all very well in theory, but how can it be put into practice? Easily enough, if parents have the full confidence of their children; if they have not, they have lost the most sacred right of parentage.

Two cases, illustrating the two methods of giving this instruction to children will suffice; both have come under my own observation: The mother of a little girl of ten was about sending the child to a public school, but could not bear the thought of having the child's mind poisoned concerning these great truths, by contact with the vicious thoughts of older girls. She thought about it and prayed over it. Just before school opened, an opportunity presented itself in the birth of a baby in the immediate neighborhood. The child herself introduced the subject by wishing, in the presence of her mother, that she might have a little brother or sister. Then the mother told her all

that was necessary for her to know—how she, herself, had once been a very little creature within her own dear mother's body; that she was really a part of that body; how she grew larger and larger; and at last became entirely separated from her mother, and that separation meant her birth; and she must always think of that on her birthday, the anniversary of the day she left her mother's womb, even when her mother was dead and gone. When she finished, the child's eyes were filled with tears, and she threw herself into her mother's arms, saying, "O, mamma, I am so glad you have told me; I shall always love you for it." The next week the child was sent to school, and the very first day she came running home to her mother, telling how a big girl had come up to her, and asked if she knew where babies came from. Her reply was, "Yes; my mamma has told me all about it, and I do not wish to talk upon the subject with any one but her." That was an honor of which any mother might be proud; that woman felt well repaid for all the sacrifice of feeling it had cost her to so prepare her child against the insidious poison of foul tongues.

Another girl, about the same age, was sent to school, and, for the first time, heard of the mystery of birth from a lewd tongue. She was naturally high-minded

and sensitive, and she recoiled from the revelation with a sense of disgust; but it did not stop here. The same girl followed her up, and told her that her own mother was in the "family way," and that she would soon have a brother or sister, which was true; and when a little brother was born the child's mind and heart were so poisoned she felt that her mother had done something disgraceful; that she never, never could love her again. The child had really worshiped her mother up to this time, and the change in her manner was so marked as to attract attention; but the mother, who suspected the cause, was almost heart-broken. That child is now a woman, and she, herself, told me the story, and said she felt that experience had left a stain upon her very soul. It was years before she could disassociate the sacredness of birth from the degradation of vice. While I believe this first information had better come from the mother in most cases, yet I think all fathers should talk of these things to their sons, and thereby inspire them with a love and worship for motherhood, instead of letting them drift into manhood, as in so many instances, with the feeling that woman, as such, is only a prey to be hunted down, and they, themselves, lose nothing by the full license of lust. It is in the power of every

father to make and keep his boys pure. Nothing short of that should satisfy the soul of any true man.

MATURE AGE OF WOMAN.

Hitherto, women have been taught to consider themselves invalids when young girls, because menstruation was not established; then, as still worse invalids because it was established, and finally as the worst sort of invalids because it was disestablished. The absurdity of this teaching is apparent upon the face of it; it is even worse than an absurdity; it is an arraignment of the Creator, for it charges him with the effects of the folly and wickedness of human beings themselves.

It is to the period of cessation of menstruation that I wish to call attention, and I am prepared to affirm that no woman should be conscious of the cessation, so far as her health is concerned. It is just as natural and physiological for the discharge to stop as for it to begin; neither period is, of necessity, one of sickness. I regret to say, that while the expectancy of having a hard time at this period generally prepares the way for it, yet, on the other hand, positive disease is often overlooked and neglected under that vague diagnosis, "change of life." For example, I have known women to suffer from hemorrhage all the

way from three to ten years, supposing that their change was coming on, when examination invariably revealed the presence of tumors, or some other morbid condition. The mind of woman cannot be too quickly disabused of this wide-spread, popular notion, concerning the necessity of some great disturbance at the change of life, lasting an indefinite time, and not considered amenable to treatment. Especially should women guard against these peculiar mental conditions which are so common, but which are the legitimate offspring of the kind of life they have led previous to this period. A large proportion of child-bearing women are absolutely living without the performance of a single healthy function. They do not sleep well, or eat well; their food is undigested and their bowels constipated; they are thin and scrawny, or fat and flabby. It is really an exception to find a woman with good firm, muscle, or anything like a proper tone to any part of her system. This condition of things they generally refer to some miscarriage, or bad recovery from child-birth, while possibly unknown to themselves the foundation was laid in their childhood, if not before their birth. After twenty years or more of the vicissitudes of an ordinary married life, it is little wonder there is a general breaking

down. Those alone who have sufficient vigor of constitution can hope to weather the storm. Vitiating, stagnant blood is responsible for a great deal of the disturbance of the system at this time. What are known as "hot flashes" are often relieved by the simplest hygienic measures—the restoration of the circulation and nutrition of the skin, by the methods I have previously described, being of the first importance.

Of course, if tumors, lacerations, or any actual diseases of the pelvic organs exist, they should have the care of a physician without delay. As to the morbid, mental states, I have known them to disappear entirely under the influence of good hygiene for the body, and some useful engrossing occupation for the mind; something that calls the thought entirely away from self-contemplation. In these days of popular science no woman need be in ignorance concerning the structure of her own body, or unacquainted with the common laws of health. If she acts with even ordinary intelligence toward herself, she will enter upon the last half of her life in full possession of all her faculties. Then with the discipline of mind that comes from acting well her part, and the leisure from the care of children that her age guarantees, she is better

prepared than ever to fill a useful, honored place in society. Instead of sitting helplessly in a corner, and known only as the old lady, the woman of fifty, sixty and seventy years should be in the very prime of her physical and mental strength. Instead of being the winter of her desolation, this should be the rich harvest-time of all her previous years. All over our land are we beginning to see the fruits of such harvests, for all over the land knowledge is being disseminated among women. They are learning the lesson that whatsoever they sow in childhood, and early married life, that shall they reap in their maturer years.

APPENDIX.

APPENDIX.

CO-EDUCATION OF THE SEXES IN MEDICINE.

[Read before the Woman's Club of Chicago, 1867.]

Like an inspiration comes back to me my first vision of an old city, more ancient than Rome, that lies sleeping at the foot of the Appenines, like a tired warrior at rest—rest from great victories won for humanity; a city which deserves above all others to be called the City of Woman; that has dedicated its greatness, past and present, to the genius of woman—the city of Bologna. There is music in the very names of Bettisia Gozzadini, Novella Andrea, Novella Calderina, Madalina Buonsignora, Dorotea Bocchi, Laura Bassi, Anna Manzolini, Gaetana Agnise, Christina Roccati, Clotilde Tambroni, Maria Dalle Donne, Zaffira Ferati, Maria Segà, Madalina Noe, some of the illustrious honored women who graduated and taught in that grand old university—graduated and taught as doctors of philosophy, medicine and law, while, as if sacredly to preserve this dedication to the genius of woman, Raphael's immortal St. Cecelia is to-day the guardian angel of Bologna.

Then came the honored names of Pavia, Ferrara

and Padua, till it seemed that for every star that shone above me in that soft southern sky I found in history an answering star. Was it all a mistake? Were these illustrious women deluded and disgraced?

Contradictory as it seems, the whole continent of Europe is more liberal in its education of women, especially in the study of medicine, than either Great Britain or America.

Famous physicians of our sex have gone forth from Salamanca, Cordova, Alcala, Heidelberg, Gottingen, Girssen, Wurtzberg, Utrecht, Montpellier, Paris, Vienna and St. Petersburg. In the latter city, especially, women of noble rank crowd the universities. There were at one time four hundred in attendance. There a lady is proud to add to her already titled name the title of M. D.—is proud to be employed in a work so noble. Quite a commentary this upon the manner in which some of our society women elevate their pencilled brows at the mere mention of a woman physician, and have even been known to refuse an introduction to such an one, while the facts in the case were, the physician was a lady by birth and education—had rank by virtue of inheritance—if that means anything, while the would-be lady held her rank by virtue of her husband's purse.

A friend, now studying in Zurich, writes as follows: "I wish we had something like this university over there. I think it a shame that here in Europe, where prejudice against woman's emancipation is much

stronger than in America, that here a mixed school for medicine exists in perfect harmony with good taste and order. Why is it that we cannot have such a thing in our country, where they pretend to respect women more than anywhere else?" Why is it? Why, too, does England, that owes so much of her civilization to woman, whose most illustrious eras of history are those of Elizabeth, Anne and Victoria, why does she allow herself to be thus put to shame by continental civilization?

Woman in medicine, to our mind, is not so open to question as man in medicine; nor can it become such till women make specialties of the diseases of men as men do now of the diseases of women. Then, indeed, will there be ground for argument; then, and not till then, may we *question* the propriety of women in medicine, and until then the question of propriety is on the other side entirely.

However, so long as the question *is* raised in the minds of many, it becomes us to look at the arguments, such as they are. The question means, shall women study medicine at all? For, as we shall see, if she studies she must study with men, and the *final* analysis of the question is, Shall women study anything?

Now one of two things must be true: woman has or has not the right to study medicine, and that right includes the best possible way. We do not mean right in the sense of that Boston sage who tried to be

witty when he said, woman had the right to sing bass if she wanted to; we mean right, not only in the sense of free will, but the conditions provided for the carrying out of that will, both structure and environment. We have no conception of possessing any possibility whose conditions are not provided.

Before considering the right of woman to study medicine, let us consider the right of woman to study at all, for this is the logical starting-point of the whole question.

It is almost an axiom in physiology that the presence of an organ presupposes a function. There are two great classes of functions, voluntary and involuntary. Physiologists further classify them as functions of animal and vegetative life. By vegetative functions, we mean those only that are essential to existence. Respiration, circulation, digestion and reproduction can go on perfectly without any brain at all. It is true there are some anatomical forms in the body which have been supposed to have no special use, but are simply the remains of some lower or pre-existing animal form; but we are hardly prepared to call woman's brain a remnant, though woman, herself, is often called a relict.

The highest function of brain is the production of thought. Now it is in the order of things that perfect function depends upon perfect development, and this development depends upon the activity of the

part. Inactivity not only arrests growth, but it wastes away that which is already grown.

Any one of us can demonstrate this for himself by placing any part of the body in a state of absolute rest. It is demonstrated in disease, by the failure of nervous supply to a part, thus making motion impossible; hence the gradual wasting away of parts that are paralyzed. Not only is activity a physiological law, but the amount of activity is a part of that law. There are certain limitations in the very nature of things. "Thus far shalt thou go, and no farther," contains two commands. "Thus far" is as full of meaning for us as "no farther." Not enough is as guilty as too much, when applied to the activities which develop form and function. The physician is as often baffled by underdoing as by overdoing.

The highest exercise of the brain is the production of thought. Each brain has its limitation, as each body has its stature. Up to a certain point, nature provides without consulting the will of the individual. There is an instinctive motion of the mind and muscles, and we have yet to learn that the instinctive activity of the female has any narrower limitations than that of the male. It is only when the will begins to preside that we find a restraint imposed upon female activity. The source of this restraint is a traditional sense of propriety, growing out of the original condition of woman, viz., slavery. In primitive times, women were bought or captured; in either case they

were the slaves of men. The beautiful, were favored and protected, while the ordinary were the victims of servitude in its most abject sense.

We may well ask ourselves how this came about. If woman originally was the equal of man, how did it become possible for him to enslave her? We must admit physical inferiority, but with an important modification, viz., the inferiority is one of quantity, not of quality. The motor system, that is, the muscles and bones, of men is larger and stronger than the motor system of women, but the muscles and bones of women may be just as perfect, even more perfect. An elephant is larger and stronger than a horse; so is an ox; but it is the quality of the motor apparatus of the horse which makes him preferred to either as a beast of burthen. To consider the last argument of this avoiddupois question, the brain of man weighs heavier than that of woman; therefore woman is mentally inferior. To answer this question, it must be remembered that what is called brain is composed of two essential substances—the white and the gray matter. The gray matter is made of cells which do the thinking, the white matter is made chiefly of fibres, which conduct messages to and from the gray matter. Then there is a quantity of tissue, in which the cells and fibres are packed. Now, curiously enough, the amount of gray matter need not in the least affect the circumference of the head, because of the peculiar anatomical formation of a well-developed brain. The pleat-

ings or foldings called sulci may be very numerous and deep without adding greatly to the size of the brain.

It is not difficult to understand, then, that a brain may be large and heavy by reason of the packing, which may be in excess of the thing packed. Man being more active than woman, having a larger motor apparatus, we find a corresponding increase in the motor part of his brain, viz., white fibres and motor cells.

Curiously enough, while men have been weighing and measuring the female brain, they have forgotten to measure and number the sulci, in which so much gray matter may be hidden away.

Judging from the amount of gray matter in the brain of woman, we should say it was placed there to be used, and the only limitation to its use is the law under which this organ of thought is constructed.

The first mental exercise that the master, man, allowed the servant, woman, was in the direction of art, by way of making her more interesting to himself, while the science of all art was kept not only closed but padlocked. The arguments of woman's mental inferiority always contain this stereotyped question: "Why are there no great composers and artists among women, when music and art have always been open to them?" When we have learned to fathom the depth of the meaning of the word accomplishment, we shall be able to fathom the depth of woman's

knowledge of any study in which she has been allowed to indulge.

It is only when we attack a subject with the intent to wring from it some great need of our own life, that we can in any sense say we have studied it, much less that we have mastered it. If the secrets of things were possessed of intelligence, they could not more successfully combine against amateurs.

The question arises: Is it in the nature of women thus to study? No. The mistake the masters made was in ever placing the cup of knowledge to the lips of their slaves. For a while they were content with sipping, that their lips, perchance, might be more beautiful.

But the sipping has excited a great thirst, that will not be satisfied till the cup is drained to its dregs. The slaves were not satisfied with the A, B C; they have reached out after the combination into words, thoughts, books, science, principles, till the whole vast realm of the kingdom of intellect has been captured! And how was it done? Simply by making a beginning. A little knowledge proved a dangerous thing. By allowing the mind to be exercised at all, it exercised all. Nature can never be so repressed, so transformed by artificial forces, but that it recognizes and uses its own whenever and wherever found. The wild animal may lie in your arms and peacefully lick your hand, but not for your life dare you let the smell of blood come to his nostrils. So has the mind of woman slept,

lulled by the narcotics distilled by a sensual life, and now the reaction of the awakening is terrible in some of its manifestations.

Granted the right to study, we must also grant the right to study in the best possible way.

First, we lay down the broad principle that man and woman were made for each other, physically, mentally and morally, and we would maintain this principle, not by mesmerism or spiritualism, nor any species of moral infidelity, but by science.

Nature makes no provision for the separation of the sexes at any period of their existence. They begin life in the same family, frequently at the same birth; their environment is precisely the same. The closest analysis has never been able to discover any distinctively female air or sunshine. So far as the researches of physiology have gone, no special male food has as yet been discovered, unless tobacco and alcohol be such. If boys and girls may feed their bodies with the same things, from the same table, by what logic can we separate the same boys and girls in the process of mind-feeding? Upon the same principle there should be female churches; if the mind can not bear mixed education, much less can the soul. It is true the Jews and the Roman Catholics in some places fence off their women by curiously constructed pens and bars; nevertheless they feed them the same strong theological meat, and if a woman breaks the law of Sinai there is no law of sex in the penalty.

And their women have been the conservers of the religious power in both Jewish and Catholic church. Any distinctively feminine or masculine institution is morbid in its tendency.

The idea that men and women are to be kept apart originates in the lowest conceptions of the relation of men and women, viz : the sexual. It gives to sex undue prominence by keeping it uppermost in the minds of the young. The female boarding-school is, in the very nature of things, the hot-bed of morbid influences. Half the vices of men are the direct offspring of the unnatural education of men. The monasteries and convents that Protestants have reared for their children are worse than those of the Catholic, because they lack the religious enthusiasm of the Catholic. If any doubt the truth of this let them investigate the popular fashion called "smashing," as it is practiced in certain colleges.

Men and women were made for each other, in all the higher and spiritual as well as the lower and physical relations of life, and when you separate them at any time of their lives, in all the higher you rob them of their birthright.

Why is an American girl capable of taking care of herself among the wicked men that congregate in the European capitals, where a native-born girl must be doubly guarded ? Because, to use plain English, the American girl is not continually thinking of her sex. She is so accustomed to the companionship of the

other sex at home, in school, and wherever she goes, that she has natural, not morbid, thoughts ; she thinks of herself simply as a human being, and man as another ; she escapes insult by not expecting it. Not so with the girl just let loose from the restraint of a convent—Protestant or Catholic. The frame of mind that anticipates insult courts it. Every institution departs from healthy normal development just in proportion to its exclusiveness. If reproduction were the only end of woman's existence, we have seen that it is provided for without the intervention of the intellectual faculties at all ; but we find not so much as a cell wanting in the cerebral development of woman, notwithstanding the lethargy in which centuries of tyranny have steeped her ; hence her mind must be as capable of companionship as is her body. Whether or not woman had from the beginning more personal chastity than man, we are not prepared to say. If not, then the results of unchastity falling so heavily and unequally upon her have reacted upon her character, so that now she is really more virtuous than man. The fact exists, whether the condition be original or acquired. But along with this personal purity comes a sort of selfishness or narrowness. The woman's idea of right is personal, a something that belongs exclusively to her, while the man's idea is so impersonal that he frequently leaves himself entirely out of the question. We have known women to arise from an ecstasy of prayer, having supplicated

for mercy with the tongue of an angel, and deliberately go to work and plan an act of gross injustice. Of the two evils, man's inhumanity to man is preferable to woman's inhumanity to woman. The exclusively womanly or the exclusively manly organizations are always lacking. The general and the special need to unite their forces, and thus individual character shall be both comprehensive and personal in its righteousness. Woman needs less personality; man more. George Sand had the typical man's view of life, which is, to say the least, very unbecoming in a woman. It is this constant concentration of thought upon herself that forms the basis of that hydra-headed disease hysteria, a disease which the doctors may well pray to have continued, for if ever it be concluded they will have less to write about, and still less to do. It is true that hysterical women are the support of a large number of physicians, and it is notoriously true that these patients invariably prefer gentlemen physicians, though the disease is not one that requires man's superior skill in medicine.

Lying between the spinal cord and the brain proper are a series of bunches of nerve cells, which are capable of feeling and acting, but which are not capable of elaborating the impressions they receive into ideas. In the lower animals we find these bunches or ganglia highly developed, much larger than the brain itself. In idiots also they are well made, while the cells of the brain substance proper are very poorly made, most-

ly not made at all. The point of application is this : We can predicate a kind of mentality of the spinal cord, though perfectly automatic; a still higher mentality to the middle brain, or these ganglia which we have mentioned, a mentality into which feeling enters, the consciousness of pleasure or pain. Impressions received from without may stop here, and never give rise to anything but an emotion, a feeling; or they may pass on to the upper brain cells and give rise to the highest intellectual conceptions. Music furnishes us with a good illustration of the separate and combined function of these three nerve centers. The mechanism of music is performed almost entirely by the spinal cord. The emotion of pleasure or pain excited by the sound has its origin in the ganglia, while the intellectual conception of music, the power that creates an oratorio, lies in the cerebral cells, and the real musician is an embodiment of this triune power. The ideal human being is one in which the automatic, the emotional and the ideational are perfectly harmonized. By inheritance and education the emotional centers become unduly developed in woman; hence she acts from feeling instead of judgment, according to the time-honored standard—it is womanly to be emotional; and indeed the typical woman has very little need of a cerebrum at all, and the fact that she has one is only another proof of the conservative power of nature, the power by which all things, when once created, maintain their identity. The compan-

ionship of the sexes in the higher departments of learning can not help but establish a better equipoise of character for each. The emotions and the passions find their true level ; instead of controlling they are controlled by an educated will. Thus we may declare the attempt at co-education in this country a practical, successful fact, and the only difficulty that has ever arisen in its way has first arisen in the mind of some bigot, who has attempted to twist facts into a proof of his theory. Witness : Dr. Clarke's " Sex in Education."

Now, as to the specific question before us, shall women be educated with men in medicine ? This is equivalent to asking shall she study medicine at all, for as we shall see, *if* she studies, she *must* study with men. The argument is set forth with a formidable number of negatives: incompetent, improper, unwomanly, etc. Woman has proved beyond a doubt her competency to learn medicine, by passing the most rigid examinations and capturing more than her numerical share of prizes. It is singularly true that the women who apply for examination in the European universities are never plucked. We should be sure to hear of it if they were. And this means a great deal when you add to a cruelly rigid examination the prejudice which some of the professors are sure to have against a woman who is thus flying in the face of providence, and the dissent of one professor can prevent the candidate from passing. Still the oppo-

nents argue that while a woman may *learn* medicine, she can not practice it, and the back-bone of this opposition is periodicity and maternity. It remained for a woman to revive the theory held by the fathers in medicine, viz.: that the periodicity is a physiological and not a pathological process; that whatever of disease is in it is the result of abuse, as dyspepsia is not digestion, though it often takes the place of that important function; and this same woman has done more than the fathers did in that she has proved the theory by scientific facts. The truth is, the period is one of increased rather than of decreased power; instead of a source of weakness it should be a source of strength, and would be if the nervous system were not out of balance with the other forces of the body. But be the theory what it may, the facts are, women by thousands are at work everywhere, in all countries, at all hours, every week and every month, at all times in the month, who know nothing of the theory; they only know that they must earn their bread, and they do it. Industry is no new thing for women, but high-priced industry is, and that is the kind of industry that is injurious to females. Women in the profession, of medicine, who now rank by hundreds instead of tens, do not lose one week every four, though Dr. Clark and others have so instructed them. If women physicians were thus incapacitated they would still be able to compare time favorably with the majority of male physicians who are suffering from divers dis-

eases. We have in mind several of the leading lights in the profession who are daily fighting tuberculosis, dyspepsia, kidney and intestinal disease, to say nothing of those who are troubled with chronic alcoholism. But dyspepsia and delirium tremens in men are only eccentricities. The main difference now between the practice of medicine by men and by women is that the mistakes of women are not tolerated ; our sex have not earned the privilege of making mistakes, a privilege that comes only with long practice.

If periodicity is thus answerable, maternity is not. It has been my lot to know something of life in hotels and fashionable boarding-houses. I have observed that the women who expected to become mothers were exposed in what seemed to me the most cruel manner, attracting far more attention than any physician could attract at her daily work, while as to the amount of work performed no physician could have exchanged places with them. If shopping, calling, dressing and dancing, unflinchingly pursued up to the day of confinement, if these are not hard work we do not know the meaning of the word. But the same women would be shocked, horrified, were you to put some useful occupation upon them, even though it expended far less of their vitality in its performance, and the world too would cry out, how unwomanly!

Just so long as woman's work is aimless, useless, she can brave any exposure up to death itself, and it

will all be charged to the amiability and sweetness of the feminine mind; but if she die in the harness of a useful occupation, this comes from departing from the path of duty assigned her by providence. I have, observed, also, the habits of the poor during the child-bearing period. They wash, sew, bake and scrub up till the last moment. I have known the poor housewife to finish enough washing and baking to last through her illness, and give her floor a farewell scrub, all after the first labor-pains were upon her. If the poor creature had been engaged in a lucrative pursuit, whereby she was earning enough to pay for proper care during her confinement, providence and the path of duty would have received another sentimental shock; but because she is earning nothing, no strong male voice warns her against the violation of the laws of her being; no strong male arm is uplifted to protect her. We see, then, that women do work hard and long all through periodicity and maternity, and the only reason that the work is not questioned is that it is unpaid.

Granting all that is predicated of both conditions, we must remember there are still from twenty-five to thirty years of a woman's life entirely free from the influences of both conditions. And we have yet to learn from any scientific standpoint why a woman at forty years of age should not be in the prime and vigor of her womanhood. Such she would be were she not made to believe that the sexual function is

the principle function of her existence, and when that fails she must fail.

It is time that thoughtful women were asking, "Need these things be so?"

The physical disabilities being thus conquerable, we approach the question of propriety and fitness. I confess to having had scruples in this direction, but they all vanished at my first clinic in diseases of women. A woman was the subject stretched upon the operating table ; a woman was the servant, the nurse that stood by the table performing the menial part of the operation ; men were the physicians who were profiting by the operation. We reasoned thus : if it is proper, and we have never heard that it was not, for a woman to lie there as a patient ; if it is proper, and we have never heard that it was not, for a woman to stand there as a nurse, why is it not proper, and we have heard that it is not, for me to stand there as a physician ? Why is peerage more unbecoming to women than vassalage ? If it is indelicate for a woman to be a physician, much more is it indelicate for her to be a nurse, and *thrice over is it indelicate for her to be a patient.*

The longer I practice medicine the more I am assured that there is a great moral question involved in certain kinds of practice. I forbear to discuss it ; but I must say in justice to professional men that they deserve a great deal of credit whenever they maintain a high standard of honor. They certainly sus-

tain a strain upon their morals to which human nature in its present development should not be subjected more frequently than is absolutely necessary.

The inevitable result of mental development is the amelioration of the condition of the human being. It is an advantage man possesses over all his brother animals. They must submit to the situation, be it ever so unfavorable; he may modify the most untoward situation by sheer force of mind. Women are just as much in need of this ameliorating, modifying power as are men, because the misfortunes of life fall even more heavily upon women than upon men, and nature has endowed her with the power of mind to overcome these misfortunes. But, it is feared, if women *use* this power it will revolutionize society, especially in its domestic relations. To many, the self-dependence of women means no more homes, no more wives, no more mothers. A Platonic Republic is the logical outgrowth of woman's independence.

I have observed two things: First, that the ordinary oak usually becomes awfully tired of the ordinary vine. Secondly, if there is one thing above another for which human beings constantly maintain a wholesome respect, it is a pocket-book. Judging from these personal observations, I believe there is no one thing which could so favorably modify domestic life as to make women self-supporting.

Successful occupation is the cure for many, many sins. The ordinary practice of medicine is one of the

most natural and appropriate means of self-support for woman. There are many men, and good men, too, that cannot conceive it possible for a woman to practice medicine and at the same time be womanly. They forget that the essence of womanliness, as of manliness, is *born*, not *bred*. It is intuition, the predestinated disposition, if you please, of the ultimate atoms, not mere education; it is inspiration, not inflation, and if this primordial, foreordained essence be wanting you'll find coarse-mindedness, though the subject may never cross the threshold of her own boudoir.

A real woman becomes all the more womanly in ameliorating the sufferings of others. All the more delicate and sacred to her becomes the great mysteries of life and death, when she becomes the ministering priestess, as she has ever been the ministering servant of both.

If, then, women may study medicine, the question arises, How shall she study it? alone, or with men? She cannot study entirely with her own sex, for as yet there are not a sufficient number of women of brains and experience in the profession to do the teaching. For years to come men must be their teachers. The question naturally asks itself if women may learn *of* men, why may they not learn *with* men? To make the argument of co-education consistent with itself, our medical teachers should all be women—a result which, however competent women may become, we hope never to see.

With the possession of the best teachers is also the possession of the best colleges. The educational curse of this country to-day is the multiplication of educational institutions, and the rearing of separate colleges for women is but adding to the difficulty. The cheap schools of this country, medical and otherwise, need boiling down. The money which we spend in our separate schools had far better be spent in opening the doors of the old institutions. If thought necessary, there may be separate lectures on certain branches, as is the plan at some schools now, but we think the necessity a species of mock modesty; there should not be, and there really is no sex in science. We think there is no comparison in the moral effect on the sexes of a day's work in the dissecting-room and a night's revelry in a ball-room.

There is, perhaps, no mother who would not feel proud to send her daughter to the Queen's drawing-room. That is, certainly, the very top of the scale of social life. But there is far more exposure of the person, far more to bring the blush to a modest cheek, in one such exhibition than in a whole medical course in a mixed college. Modesty is a relative virtue, custom regulates it. The tribes that go naked have no feeling of shame; neither have the half-dressed women of society. Why should the students of science feel shame, or think of shame, when only the highest faculties of mind are engaged, not the emotional centers, as in the dance. Then, too, we must consider all the

appointments of the ball-room; their influence is sensuous to the last extreme. Chas. Reade says: "The pedants who object to promiscuous botany never think of objecting to promiscuous dancing, which, in some of its belongings, the custom of ages has failed to render decent."

I am prepared to make this statement: There is no medical subject that may not be lectured upon in the most refined and modest manner. The nomenclature of medicine gives the lecturer the power to lift delicate subjects up from the plane in which vulgar language places them. No young man can afford to have the *morale* of his nature spoiled by hearing these subjects described in indecent language, and if the entrance of women into male colleges is going to make the professors and students more refined, all hail the day. That such is the result, we find upon inquiry to be true in the few colleges that admit women. The professors themselves say they will do everything to encourage the presence of women, if only for that purpose alone.

Foreign schools have no difficulty in educating the sexes. "How do the students treat you?" I inquired of one who has recently returned from Zurich. "Just as students," was the sensible reply. "There is never the least offense offered; neither, on the other hand, are they intrusive in their politeness."

Finally, I believe in co-education, because really all the medicine we know is learned at the clinic. Our

system of educating women is thus rendered ludicrous. We go off by ourselves in the separate college to listen to didactic lectures containing no word offensive to the most fastidious, while the great bulk of our practical knowledge, indeed all of it that relates to general diseases, must be obtained in mixed classes, because all the important hospitals are under the control of the male colleges. The only objectionable part of the study, then, is learned by woman here, just as on the Continent, while the harmless laboratories are all locked and barred against us. Fortunately for women, they know how to get nourishment out of crumbs even. They are so used to picking up what is left, and making use of the pickings to the best advantage, that some of them have already made most brilliant reputations from chances most meager.

To sum up, I believe in education, first because woman has a brain, and the presence of an organ presupposes some use for it. The female part of the race needs the uplifting, the modifying power which is the outcome of mental development.

I believe in the medical education of women because it opens up an honorable occupation peculiarly fitting to women. I think it better that she should perform a scientific instead of an ignorant kind of service under precisely the same circumstances—especially when the scientific is the more lucrative.

That it is a lucrative means of support is to be remembered, for women are in great need of financial

self-dependence. Dependence is the mother of many, many crimes.

I believe in co-education, first, on the broad principle that there is no sex in science, or in any of the higher departments of learning; that exclusiveness in education is unnatural and morbid in its tendency, giving too much prominence to the lower part of our nature, because that is really the basis upon which the separation is made. It is in itself a gross insinuation. I believe the reflex influence of co-education upon character is good and healthful. Secondly, because our teachers must be men. Thirdly, because of the perfect success of the co-educating schools of medicine. Fourthly, from a financial point of view. We cannot afford to support more institutions than we already have. Cheap, ill-appointed medical schools are already the curse of the profession.

Finally, I believe in co-education, because, practically, we are thus getting our education. The only place to learn medicine is in the hospital—our separate education is purely theoretical.

The following editorial [*Medical and Surgical Reporter*, July 31, 1880—three years later than the date of my paper] treats upon the leading arguments of the above paper so fully and so fairly I cannot forbear to quote it in full. Coming from the most conservative city in this country, Philadelphia, it certainly deserves to be made known to all the friends of woman's education :

“The questions which interest medical men in relation to this subject are mainly these : Are girls physically adapted to sustain the same course of study as youths ? Is the co-education of the sexes desirable ? What limits does physiology set to the business and professional education of women ?

“The first of these inquiries seems to us to have received a positive reply in the affirmative by that inexpugnable authority, experience. The doubt was long raised that as much brain work as youths perform would interfere with the regularity of the menstrual function in girls ; and that the sickness incident to these periods would prevent them from equal competition. The facts are not so. Either the brain work of the average youth is never enough to hurt the average girl, or else the latter can stand more than she has hitherto had credit for ; the result of large experiments, carefully conducted, prove conclusively that the girls of this country can carry out the course of study in our high schools and colleges without exposing themselves to either more sickness or greater mortality than the other sex. There are, moreover, quite as many examples of distinguished scholarship among the girls as among the boys.

“There is no such unanimity on the question of the co-education of the sexes. Up to the present time the best authorities differ. Friends of the movement point to numerous institutions where the sexes are educated together with the best results. The dif-

fidence and coarseness of the boys almost wholly disappear; the audacity and coquetry of the girls are hardly known. The sexual erethism, which in both sexes is so mightily fostered by isolation and segregation, quite disappears in the indifference produced by familiarity.

“President Noah Porter, of Yale College, in his work on Education, acknowledges that considerations of health offer no decisive objections; that in some institutions the presence of both sexes appeared to be advantageous to the morals of both; that serious physical evils as well as moral ones attend the isolation of boys in schools and colleges; but that, for all that, there would be such dangers to modesty and purity in the education of both in many institutions, that in his opinion the system should be confined to very narrow limits.

“We must leave the inquiry, therefore, without any positive answer; though believing that the accumulating evidence is in favor of the plan of co-education under certain not severe restrictions.

“A more vital question is the fitness of woman for pursuits hitherto generally supposed to be only adapted for men. There has been a great deal of cant and selfishness expended in the arguments against her. All the talk about her smaller brain and her weaker power belongs to this category of cant. Most educated women one meets impress one as quite the intellectual equal of the ordinary doctor, lawyer, or

preacher—often as his superior. With the same technical training as these, the woman would probably do as well, or better, inasmuch as she neither drinks, chews, talks politics, races horses, nor seeks doubtful characters of the other sex—habits, one or all, that very few professional men are free from.

“The physical disqualifications she is under are those of menstruation and motherhood. In regard to the former, Dr. Mary Putnam Jacobi has shown, from a large study of American women, that only a small minority are disabled from active work by their monthly sickness, and that in the majority, it does not interfere at all with their regular pursuits of whatever nature.

“Pregnancy, maternity and serious uterine diseases are positive though temporary and not universal obstacles. They must certainly debar women from many pursuits, and prevent at least the regular attention to others. Those, however, who have seen the steady labor in the fields undergone by the peasant women of Europe, and that at the counter by the wives of the bourgeois of Paris and other French cities, or the heavy burdens carried by women over almost impassable roads in the mountainous districts of Norway and Sweden, the carrying power of two women being equal to that of one horse, certainly must acknowledge that much that has been written on this subject, in this country, is singularly futile, and either the product of ignorance or partisanship.

“The proper position for a scientific mind to take, and the only way in which this question can be satisfactorily settled, is to let it be brought to the test of experience. Give women free access to all trades, vocations and professions. Put no obstacles in their way. Let them try their strength in all arenas. Where they are competent they will be competitors ; where they are not, the iron law of the extinction of the unfit will operate to drive them back, without the need of any artificial obstructions.”

THE PHYSIOLOGICAL BASIS OF EDUCATION.

[Read at the Tri-State Medical Society, Springfield, Ill.]

Of all the daisies that have been turned down by Scotch plough-boys, only one has descended to us. Was it the brain or the eyes of Robert Burns that made him differ so much from the other plough-boys? We shall see.

Every observer is cognizant of the fact that the methods of education are in a transition state. The old is losing its hold—the new is getting a stronger grip. The leaven placed in the measure of meal by the gifted, but unfortunate Rosseau, is beginning to work, because the surrounding atmosphere of public opinion is growing congenial, for ideas are germ-like in their nature; they lie latent or dormant till awakened by a certain breath of life, warm and humid. It is just dawning upon the minds of educators that education should develop the person rather than increase his knowledge; and by the person we mean the body with all its organs and all their separate functions, what we call mind being one of those functions, which so far from being independent of the others, is the most dependent of them all. Here and

there an individual has long since comprehended this great truth, but for it to become a working power it must permeate the minds and hearts of the people. They must not only know this truth abstractly, but feel it sympathetically. We shall see that to be sympathetically moved is not only philosophical but physiological—philosophical because it is physiological.

The receptivity of the human mind is its great danger as well as its great strength. If prejudice gets in first, truth is kept out. The mind often sits in darkness because of prejudice against the source of the light. The Jewish nation lost the great truths that Christ taught because they despised the Nazarene. Had he been one of their own kings—a veritable son of David, who spake as man never spake before, the nation would have received him. But the prejudice against its source for the time being nullified the power of the truth. So in a certain sense the prejudice against the source of the new education has prevented its adoption. Emile came forth from the pen of Rousseau, as a poetico-philosophic rather than a scientific treatise, but as is so frequently the case, the poet philosopher felt out (sympathetically if you please) what the scientific mind is just now making out by experiment. Physiology has had a smart chase after Pegasus in a good many directions, and each overtaking proves the real Pegasus to be the

most natural instead of the most supernatural of animals, thoroughly physiological, even to his wings.

In human development there are two essentials, matter and method—anatomy and training. Rousseau's system did not contemplate structure as developed by the recent anatomy and physiology of the nervous system, but by a kind of prophetic power his thought projected itself in lines parallel with these structural discoveries, and so the theory harmonizes with facts. The import of the word educate contradicts the method; what there is to "lead out" of the human being is nothing till the world has been led in. This is the way in which man conquers the world. One by one things external to himself approach for recognition and approbation, and even the power to recognize and appropriate is not such an inherent independent quality or property of the central nervous apparatus as is generally supposed, but is itself to a great degree a developed function, growing out of the exercise of peripheral functions, as is well demonstrated in the teaching of idiots. Where does the inherent power hide itself in the deaf and blind mute, and in the idiot? Not till the sense of touch comes to the rescue, and by constant use becomes the medium of entrance for all sensations, does the mind begin to manifest itself. Even though a child be deaf, blind and idiotic, it may still be taught. Given the medium for the entrance of one single sensation, and another and another sensation, *ad infinitum*, may enter,

and each makes the way easier for the next. It is our purpose to analyze the order of the entrances and the routes taken. The first thing that approaches is the atmosphere. It imprints nature's first kiss of welcome upon the lips of the infant stranger, and asks to be admitted—the first to come, the last to go—the tried and faithful life-long friend. How does it enter? Those who have never analyzed the process say it rushes in, forces its way through the mouth and nostrils into the lungs. Not at all; before the first breath is taken the pressure without the chest is exactly equal to that within, and not till that equilibrium is broken can there be motion. First, inequality of pressure, then motion in the direction of the least resistance—a simple principle in mechanics. The lung has no power of itself to expand; but the chest must expand and pull out the lung, which is ever and always, except in disease, closely applied to the inner surface of the chest. We are thus explicit because of the erroneous ideas in respect to the mechanism of respiration. Now let nature speak for herself. See how beautifully she does her work. The atmosphere, far gentler than the gentlest mother's hand, softly wraps itself about the delicate surface of the body, and at once a thousand silvery nerve-strings which lie hidden beneath that velvet surface vibrate to that touch, a thousand silvery strings centering away in the medulla carry the message—"a stranger waits outside," and the cells, all a-quiver with long

waiting for the precious oxygen, send back answer by another thousand silvery strings, "bid the stranger enter, we need him." At once the tiny threads begin to pull at the gates, the flaccid muscles become tense and strong, the ribbed sides turn on their hinges, the diaphragmed floor descends, the chest expands, the lungs follow, eighteen hundred million cells are opened, the air enters, life begins!

As the air in contact with the surface stimulates myriads of nerve waves towards the center, so with every substance that touches the body. We say the pulsations move toward the center. This language is misleading. The molecular vibrations of the nerve-cords pass in both directions, but the receiving apparatus is at the center or at some ganglion of cells between. In this sense of touch, and its resultant motion—mental or muscular, central or peripheral—lies the very essence of education. As the air, so the light approaches; gently does it impinge upon the surface of the retina, whose rods and cones respond to the touch. The optic nerve is all a-quiver, but we have no proof that its first vibrations produce anything more than a general sensation of light. The child gives no sign that individual objects are distinguished; at first, there is only a fixed, vacant stare. We all remember the time when "the baby" first began to "take notice." The impression of light, from being general and vague, comes to be particular and definite; and just so far as the impression at the cen-

ter departs from the general, and becomes supremely special, does eyesight become an intellectual power, such as Agassiz and Humboldt possessed. Before the eye can be the window of the soul's outlooking, it must first be the window of the soul's incoming. Before a physician can pass judgment on a patient at a single glance, be sure he has used his eyes as Hippocrates used his before he painted the signs of death, in words which, to this day, have lost no shade of color, and as Harvey used his before he gave to physiology that wondrous poem on the rhythmic movements of the heart.

As with air and light, so with sound. As the lips of mother earth, before those of the earthly mother, imprint the first kiss, so do they whisper the first message. The auditory nerve answers to the first whisper, but the child does not listen. It was not something at the center that said "I am going forth to hear," but something outside, that stole softly inward, said "I have something to tell you." Over and over again did the voice whisper its message before its message was heard. How many times was the precious word "mother" repeated before its separate waves were identified! To hear, in a general way, is of no value to the hearer; it is the specialization of function that gives power to its possessor. Who better needs to know this truth than the physician? And where can he find a stronger accuser than

his own uneducated ear, which fails to interpret the mystical rhythmic sounds of life?

The idea that the mind, fully fashioned, sits enthroned in the brain, waiting to be "drawn out," can not be sustained by a single fact.

Mentality is a function that develops by the proper use of its organ, the nervous system; and there is no part of that system so remote but that its slightest vibration may be felt in every other part. Indeed, in the light of modern neurology one might find a physical basis for Swedenborgianism. If the nervous system is the organ of the soul or mind, then does the soul inhabit the body, for the body is literally filled with and encompassed by nerve cells and cords. Mind is evolved, mental nourishment or nerve stimulants enter by routes just as natural as those provided for food and air. In the study of mental evolution, nature must be our teacher. A careful analysis of the emergence of infancy into childhood, in a single instance, would serve as a type for all. But where is such analysis? Who has made even the attempt? In our estimates of the human race in this and that direction, or as a whole, what account is taken of infancy? But the physiological estimate must begin there. Some one has asked, "Who are the trees?" We would ask, "Who are the children?" The only thing we can positively predicate of infancy is contractility; contractility, too, in its crudest form; for example, compare the awkward motions of a baby with the

graceful motions of a fish, compare the crude, slow, hesitating fingering of a baby's hand with the finished, dexterous, definite lightning-like touches of Paganini's left hand. Contractility is a form of response to one's environment, which man possesses in common with all living matter; we call it responding to stimulation. Stimulation may be initiated at the peripheral, or at the central termination of the nerve-fibres. We may safely say that for a long time the stimulation comes from without, and there are those who affirm that what appear to be spontaneous stimulations at the centres, are only the reawakening of previous stimulations from the periphery; that the centers have this power of storing up such forces much as the plant stores up sunshine. It is by contact with something, somehow, somewhere, that nerve waves are set in motion, and the resultant of this motion is either mental or muscular action. How the world shall enter, depends upon structure, and any attempt on the part of the educator to bring things in through abnormal ways is sooner or later disastrous. The great fault of the old system of education is that it begins at the pinnacle instead of the corner-stone. It appeals to the judgment and reason, of which there are none, and neglects the feelings and sympathies, of which there are an abundance. Abstract ideas are fit only for mature minds. Yet an alphabet composed of twenty-six most absurdly abstract ideas is driven and pounded into the infant brain. The a b c and

the multiplication table are a good introduction to abnormal stupidity or abnormal precocity. In the one case, the higher centers repel the stimulation; in the other case they respond, but at the expense of their own structure. In a large proportion of cases, the candidates for school examinations are candidates for meningitis or insanity. It is stated that the polytechnic school of Paris produces the best scholars and the greatest amount of insanity of any school in France. The individual child should be taught as the race has been taught. The first attempts to communicate ideas among primitive people were by picture writing, and so if an object is to gain admission to the child's mind, if the thing itself cannot be brought in contact with the sight, hearing, touch or taste, let its picture enter. We often hear the statement made that it is impossible to overcome the impressions made upon the mind in childhood, but we have not so often heard the anatomical or physiological reason. These lasting impressions are made upon the sympathetic rather than the cerebro-spinal ganglia. The sympathetic system is the first developed; long before the cerebral cells have departed from their embryonic forms, and in animals that never develop a brain, the sympathetic is well at work presiding over the essential functions of life, establishing a garrison at every available outpost and making accessible roads between, till every part of the great economy is in communication with every other part,

and by a gradual transfer, not by a sudden transition, should the purely sympathetic merge into the purely intellectual. The impressions made on the lower or sympathetic ganglia, are well nigh indelible. They may not remain in their entirety, but they can never be wholly effaced, while it seems to be possible for the impress on cerebral cells to become obliterated. Hence, the danger of a wrong first impress. We once wrote in a school-girl essay that human sympathy is something more than sentiment, or else sentiment has a far deeper meaning than we give it, but we did not then know the scientific import of the statement. We believe it is Dr. E. Seguin who so clearly differentiates these two routes to the mind. He calls attention to the glow of warmth in the region of the solar plexus, the abdominal brain when ideas, or stimulators of ideas enter by the physiological route. Entering as emotions they are ready to become transformed into ideas by the time they reach the highest centers; thus no violence is done to the nervous system. Without seeking it at all, I had recently a most unique and impressive demonstration of this idea. A highly educated German physician, and a man of extraordinary natural powers as well, was describing to me the great difficulty he had experienced in learning English. After he had exhausted his vocabulary, he placed his hand not upon his heart, but upon his stomach, just over that bunch of nerves called the solar plexus, and said with an accent I can

not imitate, "when I hear my mother tongue it makes me feel so warm, so good here, and then it streams up to my head, and I feel good all over; but the English, it does not make me glow; it comes here, placing his hand upon his head; it does not come up good and warm like the German." If he had been appointed by Dr. Seguin himself to describe the sympathetic route to the mind, it could not have been more vividly portrayed. His mother tongue touched his feelings, while the English appealed only to his head.

In our system of teaching the natural "glow of warmth" in the abdominal brain is lifted up into the unnatural glow of warmth in the encephalon.

Only the other day we were asked why there were so many large headed, small bodied children in the schools? This answers it. The blood which should be in the abdominal brain supplying the organic functions—the building processes—is sent before its time to the head brain, because of the artificial stimulation excited there. There is, there can be, no better definition of the hydra-headed monster that people call "nervousness," before which physicians seem to stand with helpless hands. And just here is where the physician owes a duty to the public. Some medium of communication between the profession and the public is needed, call it what you please—State hygiene, sanitary science, or what not—the need exists.

The profession has been too exclusive of its learning, and the profession is reaping its reward, in every

newspaper in the land filled with delusions for the sick, especially the nervous. The sad truth is, we have left the public to the charlatans. The time has gone by when the physician can sit upon a throne and dispense unquestioned prescriptions in Latin. The people demand to know, and we shall be obliged to come down to their wants, the plane of their necessities. The public is deluged with irresponsible knowledge, while the only body that can speak with authority in these matters holds its peace.

As contractility is the most of the child, it is the part of good sense to make the most of this contractility; that means to place it under the complete control of its possessor, just as the contractility of the vocal cords is under the control of the singer. There is a natural order to be followed; at first the muscles contract in groups. The child can use its fists before it can use its hands; it can use all its fingers before it can use two or three of them; and all of this before it can use one finger, just as it can see all light and hear all sound before it can see a special object, or hear a special tone. The process proceeds from the general to the special, from the group to the individual. It is the difference between spading up a garden and removing a cataract from the eye. We find muscle to be very teachable; that is to say when it has been caused to contract, the tendency is to repeat that contraction. Many physiologists, with great reason, too, maintain that this contractility is the inher-

ent power of muscle, above and independent of any nerve power; but while this may be true, it is just as true that the ability to control this contractility belongs to the nervous system. It is only when we see the performances of the trained gymnast, that we begin to comprehend the possibilities of this power of contractility. It is not necessary, in order to do our work, and do it well, that every muscle in the body should be trained to its utmost. There are comparatively few who are called upon to perfectly control each muscle of the trunk and lower limbs; but when it comes to the human hand, there is not a human being born who does not need its complete mastery. Fully half the power of each generation is lost to the world, because the hand is uneducated. In the light of modern science, the ancient "laying on of hands" has great significance. The hand is an organ, not of touch alone, but of sight and hearing; one may even think with his fingers. There is no calling in the world in which this brain in the hand is so much needed, as in the practice of medicine, except it be in the profession of teaching. What impressions of momentous import are given and received, between physician and patient, teacher and pupil; and just here is where the teacher and physician should join hands to save the children. These messages of childhood need interpretation. Physicians and teachers alike should know the meaning of a quick and bounding, or a small and sluggish pulse. They

should know the meaning of a hot, dry or cold, clammy touch; they should know the full import of a soft, flabby, or a round, hard muscle; of a shrinking, receding, or an approaching reciprocal response. Thus, the children who feign sickness might be detected, and the children who are sick might be protected. This physiological handling of children is no vagary of the brain, no "glittering generality," without practical facts for a basis. The child's temperature, pulse, and respiration, are all the facts needed, facts as capable of being estimated and measured, and just as sure as the turning of the earth on its axis. He would be thought a very ignorant school-boy, who did not know the freezing and the boiling points of water; but how many school-boys, how many teachers even, know what the temperature of the blood should be, or knowing, have ever made any practical use of their knowledge. There is scarcely a household so ignorant as not to know enough of the thermometer to keep the crockery and water pipes from bursting. They know how much tension clay and iron can bear, but they have probably never heard of the tension of flesh and blood. When we graduated we could name every branch of the Amazon, and mostly all the other rivers and creeks on the globe, and every town situated thereon, but we did not know there was such a thing as the aorta, to say nothing of its branches. Was this because anatomy was too difficult for young minds? We defy the anatomo-

mist to invent harder names than the geographers have invented, and as for the personal usefulness of the Amazon, compared with the aorta, it speaks for itself. We know of an eminent physician who allowed his own precious boy to burst the fine blood-vessels of the brain learning to conjugate Greek verbs. One test of that boy's temperature would have told the father that the child needed rest, but the temperature was taken too late. "The silver cords were loosed, the golden bowl broken." The physicians and the physiologists have done this much for humanity; they have discovered the economical basis of life, and have placed within the reach of every parent, every teacher, the positive signs of danger. Health depends upon a perfect equilibrium between nutrition and destruction. When this balance is disturbed, the disturbance manifests itself by some variation in pulse, temperature or respiration. These outposts of nature are so accessible that the most stupid can find them, and learn the signals of danger. The ingenuity of man does not leave a steam-boiler unprotected that the engineer may know when the pressure is getting greater than the cohesive power of the metal; but what does the same man know of the cohesive power of his own flesh, or the governor which nature has placed within his own veins? Ninety-eight degrees F.—thus far shalt thou go and no farther; go beyond this at thy peril; what could be more definite? The fam-

ily clock has long been exalted—far be it from us to drag it down from its old place on the wall—monitor of birth and death, and all the days between; but just as easy to understand, not so expensive, not so troublesome to keep in order, and of far more vital importance, is the family thermometer. It says to the mother, to the teacher, here is the standard of human life; it marks the moment that life's forces begin to waste. What is standard time compared to such a standard? The child's education, then, must begin at the beginning—the contractility of his muscles. At first the movements are involuntary, aimless, in response to whatever stimulant is applied. The steps from these automatic motions to those that are made in response to the reason and will are slow and gradual, a methodical preparing of the way from the periphery to the center, a utilizing of the natural channels, by which the world enters and becomes the property of the individual. It is the upper and inner part of the nervous system, taking possession of the lower and outer. That formidable disease, a lack of control and co-ordination of muscular contractility, known by the people as St. Vitus' dance, yields to the physiological training of the muscles. Farini, the greatest muscle-trainer in Europe, could do more for such diseases than Charcot or Brown-Sequard, the greatest healers of nerves in Europe. But we must bear in mind that unscientific gymnastics are even worse than unscientific medicine.

The system may eliminate a poisonous drug, but an overstrained muscle or nerve is slow to recover its tonicity. So, beware of the charlatan who advertises to knead you and electrify you. We know how much strain a vegetable fibre can bear, and how long it takes to recover its contractility after it has been exhausted, but we do not know thus accurately the power of the muscular fibre; we can only approximate the standard.

To the mind of many there is an incompatibility between muscularity and mentality; nothing is further from the truth; without a good muscular development there is an everlasting antagonism between the vascular and the nervous supply. Muscular development maintains the equilibrium, and gives stability to the nervous system. If there is any difference in the mental power of man and woman, undeveloped muscles are responsible. We find that the muscles of the body have what is known as bilateral symmetry, similarly disposed on either side of the body. Bichat was the first to observe that all the organs of animal life, the brain, the cord, the senses, the organs of prehension and locomotion, all have this bilateral development. This is common to all the higher animals, and yet man is the only one of these animals that neglects the use of one-half of these perfectly symmetrical muscles. Let us see if the reason for this be one of structure or education, or both. The organ we are considering is muscle; its function

is to contract. The control of that contraction lies largely in the cerebral cells; the integrity of the cells depends upon their nutrition, or blood supply. The more immediate the connection of the cells with the heart the better their activity. The more remote the part the greater the deterioration in the quality and quantity of the blood. The nervous system demands not only a certain amount and quantity of nutrition, but a certain force or tension of that nutrition. Hence, as a rule, other things being equal, short-necked people are more cheerful and can do more consecutive work than long-necked people. It follows that the side of the brain that is in more immediate connection with the heart gets the best supply; consequently can do the best work. This brings us to consider the channels of the blood as it leaves the heart. (In order to make this part of the subject clearer we refer to the drawings made by Armand de Fleury, illustrating the various types of branching of the aorta.) We wish to call attention to the fact, that the type of cerebral circulation defines the type of the disposition. When the cephalic or brain arteries are symmetrical branches of one single trunk given off from the aorta, we get swift, harmonious motion, with scarcely any of the fighting propensity, as in the horse. The mole, instead of a single ascending trunk, from the arch of the aorta, has two, but the branching of these two is likewise symmetrical, so that there are equal-sided, harmonious movements. But when

we come to the lion, the bear and the dog, and, with a shade of difference, the wild boar, we find two ascending branches from the aorta, a right and left, the right having three divisions, two going to the brain, the other to the right arm, while the other arm or forelimb is supplied by the small left branch of the arch. Here we get a very uneven distribution of blood to the two sides of the animal, and so do we get bounding motion and ferocity of disposition. We might carry this analysis farther, were it necessary, but as far as the comparative anatomy of the brain circulation has been studied it seems to prove that the type of that circulation defines the motions and manners of the animal in question. In man the aorta has three upward branches, but the two carotids do not rise precisely alike. The right carotid, like the right subclavian, is a branch, not of the aorta, but a short trunk called the innominata, while the left carotid and subclavian arise directly from the aorta itself, the innominata on the right, the carotid and subclavian on the left, making three aortic branches. The human type is thus a cross between the symmetry of the horse and the asymmetry of the lion and tiger, and we find in man just what we should expect, a mixture of evenness and peacefulness with nervousness and snarling, to call it by no harsher name. Now, if to this structural inequality we add one-sided education, it is no wonder we get one-sidedness of character. It is no wonder we have so many hemorrhages and tumors

of the left side of the brain, and so many paralyses of the right side of the body. The physiologists having discovered and interpreted this untoward fact of non-symmetrical blood supply, have followed it up with the consoling fact that the vascular system is exceedingly modifiable, and that if a demand be created by exercising the other side of the body the supply will be forthcoming. That the one-sided action comes more from education than structure is proved by the fact that the beaver and chimpanzee, with precisely the same channeling of the blood, are ambidextrous. They seem to experience no difficulty in controlling the muscles of both sides equally. They have never heard of the awkwardness or disgrace of being left-handed, and have never been to school. If nature has ordained that the left hand should be an idler, what a mistake the violinists are making. The farther we investigate the better we shall learn that the mistake is not made by nature, but by the mothers and nurses, and that nature, like the Bible, is often obscured by the big shadow of somebody's little idea. Even the tendency of the young child to lie on the right side is less natural than artificial.

Charles Reade, who has taken pains to thoroughly investigate this subject, says the greatest authorities, from Farini on muscle to Brown-Sequard on brain, are unanimous in the opinion that both sides of the body should be equally trained. Think of the immense gain in all kinds of manual work, if the left

hand could relieve the right. This is a physiological cure for, or rather a prevention of, writers', seamstresses' and telegraphers' "cramp," while the effect upon society of an even instead of a lop-sided brain, can scarcely be conjectured. The left carotid has been making human history long enough; we should like the right carotid to have a chance. Decidedly one-sided have been the world's doings, yet, who ever thought of finding a remedy in physiology? If education has thus taken from the race fully half its power, what may it not give back to the race? We thus see that, of all the animals of his class, man is the most helpless, both mentally and physically, when life begins. Indeed, an intelligent infant is a monstrosity, and insanity or dullness is the usual condition of his adult life. It is proverbial that many intellectual giants have been everything but "smart" children. But if we could analyze the methods we should find the physiological paths to such brains all open with elements of ideas. The intellects that prove strong and stable through all the years never begin with ideas. So great an authority as Dr. E. Seguin, of New York, affirms that "the cause of almost all insanities is the discordance, nay, antagonism, raised by education, scholastic, religious and social, between the cephalic and the central parts of the nervous circuit. This is supported by the evidence that in true savage life, where the whole nervous system is evenly left alone to the drifts of instinct, insanity is unknown,

but where the strain on the mind is excessive, and the sympathetic wants are ignored or subdued, insanity is rife." The education of the so-called mind, then, is reflex, not direct; the only direct training the children can receive is of the senses themselves. If approached in the natural method, the brain accomplishes a peaceful mastery, otherwise there is constant strife throughout the realm. The vascular and nervous supplies are continually at war. Again, in our great eagerness to educate the intellect, we have ignored the child's morals as well as his muscles.

Men are not hanged, thrown into prison, or upon beds of sickness because they cannot demonstrate a theorem or write a treatise. There is no such penalty attached to the violation of a law of orthography or logic as to the violation of a law of health or morals. Schools there are a plenty that teach dead languages, but none that teach living justice. There are schools even that teach how to die, but we know of none that teach how to live. Medical schools do not; only the fittest could possibly survive the vile hygiene of a medical college. We hope and believe that the moral atmosphere is purer than the physical. The disastrous experiences of the American people within the last twenty years has proved to us that our popular education is a dangerous power. It is educating the people to despise labor, and there is nothing in it to make men honest, truthful and just. Man is the only animal of his class that starves to death in the

midst of plenty. He may be able to calculate eclipses, and speak in divers tongues, and yet die for want of sense. The power we speak of is well christened "common sense"—a taking in of the things necessary to life through the open doors provided by nature. Trained intellects, or the intellects that are worth training, are few and far between; but trained senses and morals might, and should be, the common heritage of all. This is all that ordinary human life demands. And if an individual is freighted with more than he can find use for, all the worse for the individual; he is incapacitated. This is largely the kind of work the public schools are doing—incapacitating the masses, by working at the intellect exclusively; not teaching them how to use what they get, and not stopping when they have gotten all they can use. If we wanted to improve upon a polyp, even, we should begin by training his tentacles, but the masses of people are worse off than the untrained polyp; their tentacles are paralyzed by a sort of intellectual curare, known as "getting an education." The young man or woman who has a good moral character, and knows how to do some useful thing well, is well prepared for life. Again, our greatest scientists have expressed the opinion that the Bible should have a place in the schools, because it is the best book of morals in the world. We are glad to know that a woman has tried to establish a department of morals in the schools of our land. Matilda Fletcher and Gen. Burnside began

a good work in a good place—teaching morals in the District of Columbia.

The most that the physiologists are able to do is to bring these scientific truths to the teachers, who must invent their own methods. Many steps have already been taken in this direction. The kindergarten, in its original conception, is right in its method, but the kindergarten, as practiced, for the most part simply makes a transfer from books to objects, the aim being the same, viz: crowding the child's mind with knowledge instead of developing its functions. The essence of the error is just the same, whether it be made with blocks or books. Knowledge may come; it surely will come; but it never should be made the aim of education. Education means the utmost of every organ, every function. Its work is to prepare the way and make straight the paths, viz: the five senses. The peripheral nerves, including the nerves of special sense, may be likened to so many absorbents, waiting with eager, open mouths for things fit to receive, which, when received, are transformed into mental or muscular results, as food is transformed into tissue, the transforming power in either case being something above and beyond the tissues themselves. The introduction of the world to the mind presupposes a certain receptivity—first, of the ganglionic cells near the surfaces, and last, of the brain cells themselves; and, it would seem, were this receptivity of the brain cells entirely wanting, any attempt at education would be

hopeless; but the schools for the feeble-minded and idiots prove that the embryonic tissue cell of the idiot brain can by use be transformed into the real nerve cell. If they have subserved no other purpose, these schools show the almost infinite possibility of the natural method of education, the sending of something into the brain for it to take hold of and act upon. Given one single pathway to the mind, let all the others be irrevocably closed, still the world may enter and become transformed into ideas. And when the true and kindly earth is thus led in, a truer, kinder heaven will come out of humanity. We leave it with you to answer whether it was the brain or the eyes of Robert Burns that made him differ so much from the other plough-boys.

TEMPERANCE FROM A PHYSICIAN'S POINT OF VIEW.

[Read at Lake Bluff Temperance Meeting, 1876.]

The question of appetite is altogether the greatest paradox of life. Self-regulating, or, as we term it, governed by instinct, in the lower orders it subserves the preservation and perpetuation of life. Regulated by *himself* or by *reason* in man, it may become a destroyer instead of a preserver. It is the paradox of *unreasonable* reason — the power most to be dreaded of all human or natural powers—the most prolific source of evil to the race. Well may we tremble at the winds and the waves when perverted reason is at the helm. Intemperance is no fungus growth. It is as old as the race, and has its roots down deep in the soil of man's necessities, not the necessities of the ideal man or the possible man, but of the present man, whose body is physiologically depraved, every atom crying out for some abnormal stimulant, something to quiet the vague unrest and apprehension that pervade the whole.

Physical life is expressed by infinite motion; no living thing is at rest. Superadded to this animal life in man is his mental or spiritual life, which even

in sleep is still active, like a night-watch on guard. This life, so delicately poised that no philosopher has ever been able to measure the adjustment thereof, be the balance lost never so slightly, things go wrong ; but we know not where, and we cover our ignorance with the mantle of a word, *nervousness*. This unbalanced condition is handed down from parent to child under a thousand forms. Some of the signs are simply meaningless habits to the ordinary observer; the women of a household may "borrow trouble and bite their finger nails," while the men "take to drinking." The record goes no further; but who shall trace the subtle initial cause of that "borrowing trouble," and "taking to drink." These things have a far deeper meaning than we have been wise enough to discern.

The perfection of the race demands that man shall be at one with himself and his surroundings, which in its fullest sense means at one with God. But if vice and misery are necessary outgrowths of the social body, the perfection of that body is but an idle dream. Is it possible that the world, not here and there one man, or one community, but is it possible that the great world ever shall be emancipated from its moral slavery? That it is slowly but surely breaking the shackles of political bondage, makes us hope for moral freedom.

Malthus, though a benevolent Christian himself, discovered and made known a cruel, inexorable law,

which seemed to close forever the door of hope to the race at large. He demonstrated that while the products of the earth can be made to increase in only an arithmetical ratio, population may increase in a geometrical ratio; hence a part of the human family is doomed to starvation—a simple question of mathematics. If in the very nature of things there are more mouths than there is bread, some must go hungry.

While this law is theoretically true it is not actually true, for though it is *possible* for the race to multiply beyond the power of the earth to support, it *does not* so multiply. Along with the growth there is developed a conservative power. There is in civilization what the physiologist would call an inhibitory or restraining force upon the undue increase of population, so that the problem becomes in a measure self-adjusting.

If, then, the overcrowding of population, with its consequent vice and misery, is not a necessity in the constitution of things, the reformer can stand upon bed-rock, and not upon thin air. If this wide-spread disease, human misery, is of human origin, and not the result of Almighty decree, then it is within human power to find remedies.

The fruitful source of intemperance in the lowest classes is constitutional depravity, the want of fresh air, nutritious food, and occupation.

There is abundance of air. It encircles our globe

to the depth of forty-five miles, but how successfully we plan to shut it out of human habitations! The food of the earth has never yet been measured, much less exhausted, and yet the cry of the hungry ever ascends to heaven. There is work waiting for hands to do it, but the poor hands grow weary and die before they find it. Here are the supplies; here are the people dying for want of them, but where is the adjustment? Our social reformers try to make these people better without change of condition, whereas angels would become degenerate with such surroundings. It is notorious that our systems of charity encourage and perpetuate the misery they intend to relieve.

It is only when some great calamity or crime startles the public that we begin to realize how and where the poor are living.

The sun, from a distance of ninety-five millions of miles, is finding out these places of festering humanity, and marking them from day to day through the long summer with the awful sign of a thousand dead children! We read in the daily papers such paragraphs as the following: "The authorities are waking up to the necessity of immediate action to prevent the spread of disease; the increased death rate among children has created a panic among parents. A general overhauling of the quarters where thousands of families are huddled together, like so

many pigs, in small and ill-ventilated apartments, has been ordered."

We stand here to-day surrounded by nature's best, and wonder why the world is not religious and temperate. Let us put ourselves in their places, in order to know why our fine speeches never reach the world; and if they did, what do words mean when the body is burning, freezing or starving?

If the authorities have the right to overhaul tenement houses, why not by statute compel landlords to furnish so much space to each individual, twenty cubic feet per minute, and thus prevent these terrible results? Cheap, comfortable homes for the poor would be a practical work for the temperance reform, and the possibility is within the reach of every city. The cases are exceptional where a man would prefer the saloon to his home, if he had one. We are glad to read the authorities are waking up, but it is sad to remember that the authorities too frequently wake up too late. And we fear our own fair city will only add to the long list of blunders, deliberately preferring cure to prevention, though at ten-fold greater cost. Now, in the days of her youth, is the time for her to kill the growth of a western Seven Dials, or Five Points, and they already have a good beginning in Goose Island, the Patch, and other places. Nature has done wonders by way of situation. Ours is pre-eminently the summer-city of the United States, if not of the world. No city of its size in the world

is so free from epidemics, everfreshened as it is by the breezes of the lake and the prairies. Nothing but our own stupidity can ever make it unhealthy. But the persistence with which the authorities are preventing the people from taking advantage of the great baptism which nature has provided, in the clear, health-giving waters of Lake Michigan—this is ominous of our future. If the city treasury is in need of funds, better the fines be imposed upon those who do not, instead of those who do, bathe.

Were I consulted medically as how best to promote the temperance cause in Chicago, I should say, first, let the people be washed in Lake Michigan.

This feverish, insatiable thirst that comes upon the system in hot weather is always relieved by the bath. Thus the saloons might be cheated of many a patron.

In general we would say that if a few of this city's disappearing thousands were thrown into free baths, and parks, drinking fountains and shade trees provided for the poor, not boulevards and distant parks for the rich, Chicago would lay a sure mortgage of health and morals upon the future. Here is a chance for some ambitious mayor—free bathing-houses for the people.

The intemperance of the working classes, the day laborers, is traceable to about the same causes, except that in this class overwork takes the place of the pauper's idleness. That is to say, the labor de-

manded is beyond the force which the innutritious food of the working man can generate.

This is especially true of working women, who, in addition to the day's work, must care for their children—thus one person doing the work of two, upon food sufficient for about half a person. These women tell me that by working early and late they are able to pay rent, buy fuel, etc., but can not afford to eat meat. No constitution could endure such a strain upon such a diet; consequently I find them in the hospital. [I should like to convert one end of my hospital into a bath-house, and the other into a good market.] What wonder, then, that the working man should seek some substitute for the food that is denied him, something that shall at least seem to take the place of real nourishment? And here the instincts of the man have anticipated the discoveries of science. The poor laborer has found out that his meagre fare goes farther—or what is the same in effect, *seems to go farther*, for it is a grand delusion—is more *satisfying*, when it is mixed with alcohol.

This substance stands at the head of a class which are known to the physiologist as reserve or economic aliments. It is not itself a food; it is not consumed in the system, but its presence retards the combustion of the real alimentary substances, and thereby, it is thought, promotes the transformation of heat into force. “We can understand, then, that alcoholic drinks may be indispensable, in some degree, to a

man who is obliged to perform severe labor with insufficient nourishment. As to the fatal excess which so often succeeds a moderate use of these drinks, physiology shows us that our efforts should be directed less against this than against the conditions which make the use of alcohol an imperious and fatal necessity for the working man." (Moleschott.)

In other words, let the temperance reformer see to it that beefsteak and bread are cheaper than whisky and beer; that is practical work. Cheap, wholesome food for the poor would close half the saloons in the land. Alcohol certainly does, in a certain sense, economize combustion; but it does it, as we believe, at the expense of the nervous system, for in its passage through the body it is found again principally in the nervous tissue, where it takes up its abode for some time, while some maintain that a part of it is retained. This sometime residence in the nervous tissue explains the mystery which has always surrounded the question of the effect of alcohol upon the system. The temperature of the body depends upon the oxidation of tissue, and this oxidation is regulated by the nerve centres. Alcohol, by acting upon the nerve centres, retards the oxidation, hence lowers the temperature, and this theory has been verified by direct experiment. There are those who maintain that what is thus lost in heat is gained in power. It is well known that the strength of the body depends upon the transformation of its heat

into force. It would seem that whatever lowers the temperature must ultimately lower the force, and the facts in the case support the theory. Everybody has observed that the muscular force though so violent in its manifestations under alcohol, is not real; the actual condition of the drunken man is one of weakness, and this weakness is in proportion to the degree of intoxication. We have exalted motion with decreased strength. There is a theory to the effect that alcohol acts upon only the surface of the brain, exciting the *ideas* of motion, not upon the actual motor centers themselves; hence the motion is of a powerless kind.

The only case where alcohol could possibly do good in the way of economizing force is where disintegration is out of proportion to assimilation, the waste greater than the supply; and even in this case it is a questionable policy to decrease the waste if it is possible to increase the supply. Even though the immediate action of moderate doses of alcohol has this sustaining or economizing effect that is claimed, the economy in the long run proves to be waste.

The effect of the drug is not accumulative. That is to say it takes more and more to bring about the same impression upon the system from day to day. The long continued contact with the tissues, especially the nervous, for which it has a peculiar affinity—probably owing to its great affinity for albumen—gradually changes their chemical composition, and the inevitable result is impaired health, both mental

and physical, of the individual, to say nothing of the hereditary influence on his children, which shows itself in epilepsy, insanity, criminal tendency, etc.; so that, while alcohol has the semblance of a tonic and restorer, and as such has taken a great hold upon the physician's prescription list, and upon public sentiment, it is really a narcotic, irritant poison, yet, like arsenic and opium, may sometimes be used through a long life-time. And upon precisely the same reasoning should we encourage the intemperate use of all these poisons. But science and reason preach in vain while the working man is hungry. He will satisfy his present necessity, and he finds that a glass of beer moistens his dry bread, producing a more exhilarating effect than tea or coffee, while it is cheaper than either.

In my walks through this and other cities, I have often stopped to look at a party of working men at their noon-day meal, purposely to satisfy myself as to what kind of food they were eating, and I must say that in but very few instances did meat constitute a part of their meagre bill of fare.

The drunkenness of the higher classes has two specially predisposing causes, the want of occupation and the want of rest. The tragic story of the want of occupation is incomparably told in the New Testament. The evil spirit that had departed from the man returned and found the man's heart empty, unoccupied; then the spirit took with him seven others more

wicked than himself, and they entered in and dwelt there. Doubtless, intemperance in some form, was the ringleader. Temperance has not done its work when it has taken the bottle away; its place must be occupied by some all-absorbing good, else the last estate will be worse than the first.

Here is one of the great missions of the parent, to see to it that every child has an occupation; to discover and expand the natural inclination, if there be one; if not, then to choose something for the child to do, so that it be not left to drift according to the wind and tide, so that the mind and heart shall be full; then the spirit of intemperance and its legion companions shall find no room to enter and dwell therein.

Through all our country towns, who are the drunkards? For the most part the unemployed. Young men whose fathers have let them drift into manhood with nothing to do, and the sea of life has bewildered them; they know not which course to take, and so they are left to the merciless waves of instinct and appetite. The hangers-on, the time-killers, the bar-room loafers—many a one had the making of a man within him, but the germ, finding no nourishment, has died.

Inebriate asylums are finding out the sanitary power of employment, and we quote from one of their late records: "An inebriate who is allowed to idle away his time will never acquire that mental and

physical stamina which is requisite for his reformation and cure. Employment bureaus and industrial schools, then, are grand allies of the temperance cause."

As to the drunkenness caused by over-work among the higher classes, the facts are too well known to need detail. Professional and political men are falling every day victims of ambition, which goads them on to undertake more than they can perform, and when the tired brain and muscle flag, they are scorched to renewed efforts in the flames of alcohol.

And so we find all classes, from lowest to highest, yielding to this craving for stimulants. The appetite is universal, belonging to all time and all nations; hence we may call it natural in the same sense that tendency to evil is natural. We imagine that as long as man shall live he will be tempted to sin. The most sanguine do not hope to kill out the *tendency*, that is a part of us, but we do expect to keep this tendency under control; that is what makes strength of character. To be victorious we must have something to conquer, and so nature supplies us with this omnipresent foe, of which intemperance, or in its broader sense, appetite, is the strong right arm. How shall we control it? Not by introducing light wines and beer. Fermented liquors may do for the Italian or the German, but not for the Englishman or the American; they only whet his appetite for more. The Duke of Wellington's beer-act has increased

England's drunkenness. The people, thinking it harmless because sanctioned by the government, have through it developed an appetite for stronger drink; and so we find it in the wine districts of the United States. The northern races, especially the Anglo Saxon, owing to more stimulating climate and greater development of nerve, will not be satisfied with fermented drunkenness; they never stop short of the strongest distillation. Criminal statistics of intemperance will bear out this statement. Those who believe in substituting beer for intemperance, had better study up the relation of certain forms of kidney and liver diseases to beer drinking.

We know of but two methods—education and legislation; indeed, both may be included in one, for right legislation must follow right instruction. In education religion also is included. The higher the moral standard, the purer the thought, the better the man, always. That the particular kind of religious belief does not lie at the bottom of this question, we have but to compare Catholic Italy with Protestant Scotland. Spending about the same time in both countries, with about the same opportunities for observation, I do not remember to have seen a genuine case of drunkenness in Italy, while the number I saw in Scotland outnumbered all I had ever seen before in my life. And when the good family with whom I was staying arose from their knees after evening worship, and asked me to take a hot toddy, or “night-cap,”

I confess religion and temperance took on a new phase of meaning to me.

We would especially educate women. The mothers of children should fully understand the fearful possibilities of the child. Beside the open Bible we would place the open physiology. To most people that book means only horrible bones and blood, whereas it is a gospel second only to that of Christ. An eminent American divine once said he did not believe in educating women, and as I looked at his dyspeptic countenance I thought it might have been better for him if his mother had known more.

If we could reach the poor women of our country, and teach them how to select their meagre food, and then how to prepare it in the most nourishing manner, this would be a wondrous gain to the temperance cause.

I believe, too, that the habit of drinking, *per se*, is most pernicious. In the families I know, I see the children drinking far greater quantities of liquid than their systems require. Thus the tone of the digestive organs is impaired; especially is this true of the effect of the great American drink, ice-water, of which our people, old and young, take such quantities with their food. This sudden lowering of the temperature of the digestive organs is very dangerous, and we believe a great cause of sun-stroke. Bad as we believe beer and wine to be, their effect upon the digestive organs is not so pernicious as these great draughts of

ice-water. If mothers knew the maximum amount of liquid which the system requires per day, and the normal temperature required for digestion, they might even in the infancy of the child teach it self-control instead of unbounded indulgence. Three pints of fluid in twenty-four hours, and two and a half pounds of solid food are all that are essential to the strength of a working man. One of our strongest grounds of hope for our own country is the great fact that ours is the only land on the face of the globe in which the women do not use alcohol as a beverage. This means a great deal for America.

To legislation we must look for the regulating of the sale of alcohol, just as the sale of arsenic and opium are now regulated. Both are used as tonics, yet both are deadly poisons, and as such are recognized by the law, yet neither is more deadly than alcohol. There are people in the Austrian Alps that eat marvelous quantities of arsenic. Why not, then, call it a food? No. When public sentiment is sufficiently educated legislation will discover that it has the right to control the sale of this as of every other poison with which people are daily committing suicide. The drinking of alcohol is only one form of suicide, the most deceiving and therefore the most dangerous of all forms.

To legislation we must look for the control of predisposing causes, such as crowded tenement houses,

bad food and water supplies, the whole class of causes belonging to state medicine.

As to the existence of a specific remedy for drunkenness, my observation leads me to say that we have in our materia medica several very powerful sedatives and tonics, sedatives which control the stage of alcoholic excitement, and tonics that relieve the other extreme of depression; but the difficulty lies in prevailing upon the drunkard to avail himself of either. I have myself seen men refuse to take the cinchona which was right at hand, and go a long distance for another drink; that too, after having taken the tonic—deliberately preferring the liquor. This is a clear case of choice, and I know of nothing but the grace of God that is an antidote to a drunken will.

I have thus taken a very inadequate view of what may be called the physical side of this question. I have left the spiritual part for those who are better able than we to deal with spiritual things. Among all our eminent Christians, this side has surely been well maintained. I have strong hope for the future, but I confess my hope is based largely upon a *better flesh and blood*. I have no acquaintance with disembodied spirits. I say this at the risk of being called materialistic. I accept the name, but not in its *common interpretation*. I am materialistic, but only in the sense that Christ meant when he said to the fault-finding Jews, right under the shadow of his wondrous miracle, "Whether is it easier to say thy sins be for-

given thee, or arise, take up thy bed and walk!" The first may be your preference, but I feel that I have the divine sanction, and if I could I would speak to this great world to-day, and say to every soul sick with the palsy of intemperance, "Arise, take up thy bed and walk."

A PLEA FOR MODERATION.

[Read at Teachers' Institute, 1875.]

Some one has said, "It is better to wear out than to rust out." It is a very captivating sentence. The author has simply given expression to what we have been believing and acting upon all our lives. And we make the sentiment an excuse for all kinds of abuse of our physical and mental powers. Self-murdered students quote it with their dying breath, and the doors of insane asylums close upon those who uttered it in their last sane moments. Yes, we believe, not only *this*, but we go a step farther, and hold it a sacred duty to wear out as soon as possible. There is a feeling of self commendation and saintliness in being rapidly oxydized.

The manner in which people are madly rushing on to this consummation makes one sympathize with Ruskin in hating railroads and telegraphs and every thing else classed under that specious name, Progress.

In view of the enormity of mental suicide, one is strongly inclined to believe that civilization is founded in error, and that children and savages are the only normal type of mankind. Even staid and sober England is aroused to the growing danger of the situa-

tion. One of her most able physicians writes thus:

“During the last thirty years there has been a very large increase in the mortality from diseases of the brain. In the year 1839 there were 1,495 deaths registered from this cause, and in 1869 there were 5,517. Thus, whilst the population in England has increased 30 per cent., the mortality due to brain disease has multiplied *nearly four fold*. In the same period the deaths from paralysis and apoplexy have considerably more than doubled, viz: from 10,000 annually to 22,000. The deaths from insanity have also nearly doubled. The causes for this portentous phenomenon are not mysterious nor far to seek; nor, when found, are they difficult to understand. The great development of railway and telegraphic communication has resulted in an enormous increase of business transactions, entailing a vast augmentation of the cares, worries and anxieties of life. The brain, receptive of all impressions, has a double load to bear in the economy. The ‘struggle for life’ is ever increasingly severe, every throe of this struggle implies disintegration and waste of brain tissue; and whilst the chances of irregularity or disorder in the nutritive changes increase in a geometrical ratio, the increase of disease is a logical sequence.

“It is interesting to trace an illustration of these principles in the correspondence of sudden increases in the rates of mortality with the social and commercial disorders of certain epochs. No one will find any

difficulty in recalling the convulsions that agitated the commercial world in the years 1845-46. Bearing this in mind it does not surprise us to find that immediately after this period, viz.: in 1847, we find the registered deaths from 'brain diseases' to be more than doubled—from 1,495 to 3,012—whilst the mortality in paralysis and apoplexy is increased 50 per cent. The calm that succeeded was accompanied by a corresponding improvement in nervine health, for from this year until 1852 there was no increase in the mortality from this class of causes. Since 1853 there has been a gradual increase. For every million persons living in 1853 there died from 'disease of brain,' etc., 196, and in 1869 there died 254. It is again worthy of notice that in 1866-67, years of great agitation, the average of deaths from this cause, 267 per million, was higher than in any year before or since."

If England has cause for alarm, America has tenfold greater cause. If English brain has suffered from panics, social, political and commercial, it is quite miraculous that American brain is not entirely disintegrated. We have not been able to obtain full statistics of the nervous diseases in this country during the period mentioned, but that they have enormously increased is sufficiently patent without the proof of figures. It is not without foundation that we have earned the reputation of being a fast people; pulpit and press, at home and abroad, have again and again

prophesied that we are going all to pieces; but, John Gilpin like, we gallop on—cannot stop if we would. Within a space of fifteen years one of the greatest wars in history is fought, a disintegrated union restored, and deep financial gulfs safely bridged, to say nothing of the opening and development of the great Northwest, and the spanning of the continent with iron and steam. Black Fridays blacken forever thousands of homes, a Credit Mobilier engulfs men who are the pride of the nation, a noble, stalwart Greeley falls the victim of overwork and political intrigue, and we scarcely stop to even ask why. Who can ever estimate the nerve power that burned up with Chicago and Boston?

In the hospitals, and in private practice, the physicians of Chicago are called upon daily to prescribe for those who, to use their own language, “have never been well since the fire,” and, as might be expected, the disorders are of a nervous character—a case in point proving the effect of sudden calamity upon the human system. The more complicated the organization the greater are the chances for irregularity in its action; especially must this be true of those organs which are the centre of all action, as the brain and spinal cord. Where all functions are performed by one set of organs the danger of irregularity is at its minimum. It is impossible to destroy a polyp by destroying any part of it; as long as there is life in a piece of it the functions of the animal go on; but

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when we reach the complex structure of man, where there is a separate organ for each function, the danger of irregularity is at its maximum, and the nerve force, which regulates and controls this vast and complicated machinery, is the first to suffer.

The development of intellect is becoming the disintegrator of intellect. Each new discovery, each new invention, is an added care, a new source of disease. The intensity of life force is increasing, while the amount of life force is decreasing. The causes, as has been intimated, are partly natural, largely educational. Our climatic influences are favorable to just such a development as we find. We are just far enough removed from freezing and boiling to escape the depressing influences which follow an excess of either, while we have sufficient of both to make up the variety which is necessary to sharpen vitality. We use a great amount of strong, stimulating food. We are largely a meat-eating people; hence, our restless activity and deeds of violence. It is the glaring eye and ceaseless pacing to and fro of the caged lion humanized. Cause and effect have so reacted upon each other that now we say with truth our nature demands stimulants. And so the people of the United States are unrivalled in their consumption of tea, coffee, tobacco and alcohol, while the trade in opium is growing larger every year. The fever heat of business, politics and religion, is almost the mechanical equivalent of highly oxygenized air and highly stimu-

lating food. That people wear out faster in this country than elsewhere, is not due to climate wholly, nor to the excessive amount of work performed. The work we do is not half so exhausting as the worry about what we can not do, and the positions we can not attain. A restless anxiety is characteristic of American physiognomy, from the child at school to the man at his desk. Even at places of amusement, the depressor muscles have the advantage of the levators. Whenever your mirror shows you an anxious countenance, take warning. It is the face of an enemy inhabiting your body, and will soon have full possession—an enemy far more to be dreaded than pestilence or famine, because so subtle and impalpable.

Again, there is just enough of the cosmopolitan element in our blood to give fire to that blood. An exclusive nation, like an exclusive family, necessarily becomes dormant and sluggish. We are somewhat in danger from the other extreme; but just now the mixture seems to combine the highly vitalized elements of all its ingredients, so that the boy in whose veins flows the blood of England, France and Germany, though sweeping the crossings to-day, expects to control finance or government to-morrow; and his expectation is not too great.

The largeness of our territory has its influence. Where such vast areas are to be improved the irresistible tendency is to hurry. Towns spring up like mushrooms, and the people are as mushy as the

towns—the reaction of their work upon their characters. Contrast the hurly-burly western farmer who runs a half dozen farms, with the slow, careful Scotch or German gardener, who cultivates a patch to its utmost, never allowing even a dried leaf or old bone to go to waste. Just here there is strong contrast between our own East and West. Here the land and the pork and the corn are so abundant, we have cultivated a sort of plenty-more-where-this-came-from air. Frugality and economy are almost unknown. We are nearly wanting in that strong, staid middle class who have laid up a competency by saving the pennies.

Again, our form of government fosters excessive ambition. Where position and occupation are determined by the circumstances of birth, there is less incentive to find a higher position or occupation. The mind is more or less resigned to what is understood to be inevitable; hence, greater contentment. But where our possibilities lie within our own power the mind strains itself to the utmost to reach its own ideal. Though here, as elsewhere, the two ruling ambitions are money and politics. In this country a man is allowed ten years in which to make a fortune. If he does not succeed in that time he is advised to go to stealing; and he generally goes, while the scores of would-be presidents convert their disappointment into softening of the brain and paralysis. Our young men have no encouragement to be honest,

because criminals occupy the chief places, and no questions are asked as long as their money lasts. There is no country on the globe that offers such inducements as America offers for the gratification of unbounded ambition. There is scarcely a height we do not attempt to climb. The superabundance of our activity makes us dare to grapple with forces beyond our power. It was unpalatable, but yet we had to acknowledge the point to a quiet bit of satire in the *Saturday Review*, directed against the presumption of Americans; how the staid solons of the English nation were surprised by the sudden lighting down in their midst of a young American woman, to instruct them in social and political economy. No doubt the woman was capable of teaching them many things, but who but an American would have thus ventured?

Among the other educational causes of our excessive life, the press stands deeply criminated on account both of the super-abundance and super-frothiness of its matter. The average citizen disposes of two or three dailies; our monthly literature is of gigantic proportions, and still growing, and of making of books there is "literally no end;" and the paper, magazine or book that does not savor highly of sensation finds few readers. After having aroused this abnormal taste for the sensational, the press systematically proceeds to feed it. There is not possibly time to digest this enormous amount of reading, consequently it is skimmed over, and begets in the skimmer

a sort of quick-wittedness, not thoughtfulness. Before there is time to follow one suggestion to its logical conclusion another has taken its place; hence we have keen perception but deficient reason. The processes of reasoning are slow. The too rapid succession of events is incompatible with the highest development of the ideational or reflective. The country boy who reads but one newspaper a week or month *thinks* on what he reads. While he ploughs he ponders it and draws his own strong common-sense conclusions. The result is, the second or third generation of city-bred boys take the places of clerks and secretaries, while the country boys become the leaders in business and the professions. The premature ripeness of the city must be reinforced by green country brain. We are not prepared to say, with Disraeli's hero, the invention of printing is the greatest misfortune that ever befell mankind, nor could we like Gov. Wise, of Virginia, be thankful that no newspaper was printed within forty miles of us; but while we count the blessings we also recognize the glaring abuses of this mighty tongue of civilization.

Again, our public school system, or rather our high-pressure system, is one of the initial forces in this universal rush, while our seminaries are a sort of mixture of Blimber and Squeers. Every teacher in the land, holding tight rein on every boy and girl, applies the whip, in the shape of black or credit marks, and cries "faster." The teacher who can get his

pupils on the fastest is the *best* teacher; so he who would be inclined to linger in academic shades, as of yore, dare not yield to the inclination, lest he lose his living. Parents co-operate with teachers; so, between the two, the child is transformed into a little hungry, worrying animal, that can neither eat nor sleep, lest he fail to be "punctual," "perfect," or "promoted." The word "tardy," like a horrid nightmare, haunts the dreams of modern childhood. The great object of the student is to get through. The young men are feverish to get into business for themselves, and the young women are feverish lest they become old maids, or strong-minded, the two terrors of modern girlhood.

The teachers are even more worn out and nervous than the scholars. As a class they are self-made, which means overworked brain and undeveloped muscle. Theoretically school-teaching is a healthful occupation, for the constant association with healthy youth is advantageous; but practically we fail to find a healthy school-teacher. "Burnt out" best describes their condition, owing mainly to in-door life, vitiated air, want of physical exercise, and the daily expenditure of all the nerve power their systems can generate. Blessings on the brain that shall invent a perfect system of ventilation for school-houses, churches and halls.

Having thus far analyzed this epidemic of the age, it is the part of the good physician to suggest the remedy, and "there's the rub." When the son of the

King of Holland fell a victim to croup, his uncle, Napoleon I., proclaimed a *concours*, for the purpose of finding some remedy by which the mortality of the disease might be ameliorated. Eighty-three dissertations on croup were sent in, full of symptomatology and pathological anatomy, but remedy there was none. In this, the most important regard, Napoleon's *concours* was a failure, and we find *ourselves* in much the same position as the physicians that *made* the failure. There is a stereotyped answer to all these questions—"remove the cause;" but when the cause has become a part of the patient's existence, it is not easily removed. There is reason in the argument that our hurry is a necessity; that it is the only thing that keeps us from flying to pieces—the safety valve of our life. Certainly after the pressure of steam has been multiplied and remultiplied, the engine must fly; the great force must be rapidly converted into motion, or the very molecules of the machine will be forced into space. Manifestly the remedy does not lie in stopping the machine. But perhaps away back there, before the engine started, some father, or mother, or school-teacher, need not have remultiplied the pressure. Thus we find ourselves full of intense life, and the causes are continually acting to increase that intensity. It is physically and morally impossible for us to walk when every fibre of our being is ready to run. Could the usefulness of life be increased, and its purpose better consummated by this abnormal increase of vitality, it would be a

question whether it would not be better to live fewer years and do better work. But the truth is, the friction of the machinery destroys the machine long before the work is done. Intensive life is incompatible with extensive life, and it is necessary to have the extensive life, because time is an essential element of all true development. We may force the fruit to ripen, but what is gained in time is lost in perfection. He who has forced his intellect to mature at the age of thirty cannot hope for the results that sixty years might bring.

It is a law of all life that rapid growth predetermines rapid decay. The converse is likewise true—slow growth, long life. Witness the soft maple and the oak. The master does not build his ship out of precocious timber, like the maple. So far from doing more and better work, in our great hurry, statistics show we do less and poorer work. Even the clothes we wear and the food we eat bear the unmistakable marks of haste; then the clothes are put on hastily, and the food is eaten hastily, thereby coming wide of the use for which clothes and food are intended. Our characters are reflected in our calicoes and muslins and dwelling houses; the rule is you can see through them all, they are so thin. We haven't time to make them strong and substantial.

Our people in traveling abroad are surprised at the number of aged men who are engaged in active life, especially as statesmen. To-day the great men of

England, France and Germany are old men; and yet English physicians are warning their countrymen. While our octogenarians are devoting themselves to pipe and slippers, or whiling away a second childhood, those of other nations are leaders in finance and government—men who through long and patient years have learned how to think, how to deliberate. Who of us act with deliberation? Where is there any deliberation in our senate or our legislatures? If a bill is not passed immediately we have learned it is a trick of its enemies to secure its defeat. You can count our *thinkers* in legislation upon your fingers. Even in those emergencies of life which demand the utmost haste, the mind that has been slowly and carefully disciplined is the mind for the emergency, so that for both rare and common uses the timber of slow growth is superior.

If it is dangerous to stop after having once started, it is equally dangerous never to start at all—for use is life.

It is the sacred law of all living matter, that all parts not in active exercise shall take on a lower form of life; thus come the degenerations of inactive tissue, and thus come the degenerations of inactive mind. The results of inactivity are even more deplorable than those of over work, for to death is added disgrace. To let one's brain and muscle die for want of use is ignoble in the extreme. To overwork is fatal; but there is a kind of compensation in the honor of having

done too much, which never comes to those who have not done enough. We say this for the benefit of those natural born lotus-eaters who might be inclined to take advantage of our plea against overwork.

The remedy we would suggest is the "golden mean" of Horace, that which Hume calls the best thing on earth. Moderation is the medicine for this modern mania, and to insure its success must be bred in the very bone of human beings. The trouble with us all is, just as we have by hard experience learned how to live, life is done; then we are ready to moderate, when the fire is all out, and nothing but ashes on the hearth. Americans need to learn three things: how to laugh, how to rest, and how to sleep. Art can do much to atone for the faults of climate. Though we can not breathe the joy-laden air of France or Italy, we can attain to considerable perfection in laughing, by persistent cultivation of the faculty. It is possessed by all men, and is a characteristic distinction between man and brute. We believe it a religious duty for people who are inclined to overwork, and somewhat disposed to look on the dark side of life, to go where they will be made to laugh in spite of the "blues." It was our fortune once to sit near an old gentleman at one of Boucicault's comedies. We went in the interests of hygiene, and were amply rewarded. The old man laughed so loud that the whole audience turned from the comedian to him. Opera glasses were leveled at him from every di-

rection; but he laughed the louder, and being somewhat asthmatic, the effect was the most ludicrous possible upon those who sat near. At the close of the performance he straightened himself up and exclaimed aloud, "Well, this is good for the bile!" Being interested in all remedies for bile, we set it down as a never to be forgotten principle in our therapeutics. Other things being equal, we believe every good laugh adds at least an hour to one's life.

How to rest is not easily learned. If we were to speak from experience, we would say no natural born American knows how, or can ever learn how, to rest. Rest does not mean idleness; often the most idle are the most restless. We think for Americans it means to stop worrying. It seems like Martha must have been the mother of us all, so prone are we to be cumbered by many cares. We ought to welcome as angels of mercy all agencies that can help us drive dull care away. The means to which we resort to do this will depend entirely upon our culture. What would be rest and enjoyment to one mind would be torture and disgust to one more cultivated. That principle of philosophy by which water seeks its level is true of the human mind, in all its varied functions, though fortunately, unlike water, mind may elevate the level of its own standard. To know how to rest is a fortune in itself. It is the *cares, worries* and *anxieties*, not the work of life, that are the fruitful source of the increase of disease.

Sleep is a wonderful power in the economy of nature. Shakespeare, with his unrivalled gift of divining nature's secrets, has told us what science and experience prove:

Sleep, that knits up the raveled sleeve of care,
The death of each day's life, sore labor's bath;
Balm of hurt minds, great nature's second course,
Chief nourisher in life's feast.

Shakespeare knew. When your anxious countenance is accompanied by sleeplessness, take double warning.

To those who have the interests of education in their hands, we must look for the beginning of this new regime of life. The high-pressure system must be abandoned. It makes mediocrity attempt impossibilities, and goads genius on to the next step—madness. It is unquestionable that our school-days, whether spent in school or street, give bias to the whole life; the hurry begun then and there ends in nervous disorder, premature age and death. The nervous strain under which the school children of this generation are working is perfectly fearful, and teachers are to blame. I speak from experience of a profession to which I claim the honor of belonging, (though possibly I teach more of rheumatism than of rhetoric,) than which there is no calling more honorable; but I am now dealing with the pathological, not the physiological, with the morbid, not the normal, condition of things. It would be a far pleas-

anter task to direct your attention to the many rare virtues of the profession; but the dangers of our educational system *demand* our attention. I know of a class in a high school that within the last three years have become almost hopeless invalids in consequence of the intense pressure under which they have been laboring. Usually, the girls are the first to suffer, because they have less outdoor exercise than boys. In spite of the promotions and the graduations, the boys will have their play, and it proves their salvation. Teachers must learn how to conserve the forces of life. Instead of sending themselves and their pupils home every night with every atom of vitality exhausted, they should always possess more or less reserved power, and teach their pupils how to acquire and hold the same. The broken sleep of one night is not able to make good the loss of the day, and soon the brain declares itself bankrupt. The teacher of the future must understand the *mechanics* of life and thought. Metaphysics have long been diligently investigated, but one might as well attempt to build a cathedral by commencing at the spire as to attempt perfect mental structures by commencing with metaphysics. The amount of work a mind can do depends directly upon the kind and amount of brain matter through which that mind works. There is no reason, except ignorance, why one's mental income can not be as accurately measured as one's business income. Every one is conscious when he has over-

drawn his bank account; so might every one be conscious when he has overdrawn his brain account. It takes moral courage to stop just this side the fatal step. Large self-control is needful not to touch a dollar of the principal when the interest is all used up; and nothing but the staunchest self-control, based upon moral integrity, can withstand the fever of excitement which is goading us on, and robbing this age of its grandest results. Moral truth and law are ever found indispensable to the physical support and prolongation of human life; herein is a wide departure of man from the brute; and the foundations for these are seldom laid after we are fairly out in the world, and have begun the struggle for life.

Let no student be in haste to get through. Too many get through into the grave, or what is worse. Better add a year to the course than take one from it. It does not add in the least to one's intellectual stature to look worn-out and spiritual like, and it's no compliment to the spirits. Saints who have bodies are the very best kind of saints. Let none be betrayed by the poetry of "midnight oil." That ancient lamp will do for an emblem or a frontispiece, but not for life.

Our purpose is accomplished if any are persuaded to *find* the golden mean which lies between wearing out and rusting out.

THE END.

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